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ABSTRACT

This publication is designed to help superintendents, local facilities coordinators, and food-service directors in planning the remodeling of an outdated food-service facility or the building of a new one. The introduction describes the roles of the local facility coordinator, the local child-nutrition director, the architect, the food-service facility's consultant, and the state Department of Education. Sections provide information on the following: steps in planning a kitchen facility; preliminary information needed for planning a facility; structural considerations; the receiving and storage area; food-preparation areas; serving and dining areas; offices and employees' facilities; dishwashing and sanitation areas; central kitchens and food-production centers; the food-service warehouse; specifications and blueprints; and evaluation of the completed facility. Fourteen tables and 12 figures are included. Appendices contain the California Uniform Retail Food Facilities Law, a list of large equipment approved for state funding, planning aids, and a sample plan and equipment layout for a production kitchen. (LMI)

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# SCHOOL NUTRITION FACILITY PLANNING GUIDE

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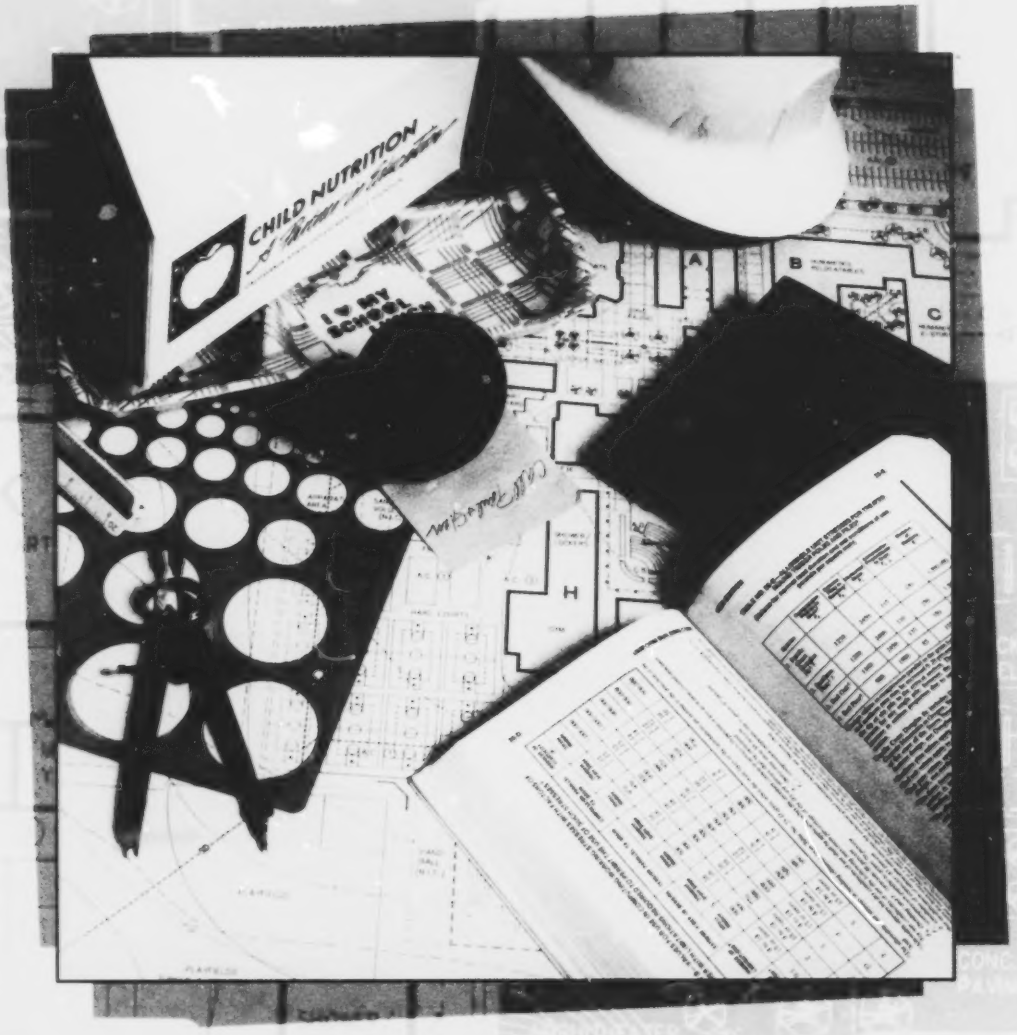


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# SCHOOL NUTRITION FACILITY PLANNING GUIDE

*Prepared by*

**Dorothy VanEgmond Pannell**

*under the direction of the*

**Child Nutrition and Food Distribution Division**
**California Department of Education**

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# P R E F A C E

The California Department of Education realizes that school nutrition programs are a major food service industry in the state. In school year 1990-91, the public school enrollment was 4,842,174, and more than 480 million breakfasts and lunches were served in California's schools under the National School Lunch and National School Breakfast programs. The school-age population in California is experiencing substantial growth, and food programs are expected to grow also. It is estimated that public school enrollment in the state will climb by 1.15 million over the next five years. The School Facilities Planning Division, Department of Education, estimates that 1,260 new schools will be built at an estimated cost of $12.65 billion during this period.

The objective of the Child Nutrition and Food Distribution Division is to administer child nutrition and food distribution programs by developing policies and implementing practices that will enable local agencies to operate efficient and effective programs. The division meets that objective in part by responding to requests for information and by providing technical assistance and training that promote understanding on the part of local agencies of program requirements, procedures, and opportunities. Over the last five years, the division received an increased number of inquiries pertaining to planning kitchen facilities for new and renovated schools.

Planned, efficient kitchens and eating areas are cost-effective for the taxpayers of California not only at the time of construction but also for years to come. The efficiency of the food service staff is greatly influenced by the layout and design of their work area. The more efficient the food service staff is, the lower the cost of producing and serving school meals.

According to the National Restaurant Association, the service industry will be faced with a tight labor market and will be competing for the available labor during most of the 1990s. With tight budgets at the local level and increased need to control labor costs, the planner of a food service facility faces a challenge to plan an efficient, compact kitchen that demands little maintenance and upkeep and that promotes high productivity.

New technology and changes in the food service industry should be considered and anticipated in planning the school's kitchen. The kitchens that are planned and built today will be used well into the twenty-first century. Aseptic packaging systems, computer technology, increased accountability, point-of-sale terminals, short water supply, and the ecology are just a few of the factors that must be considered in order to make the kitchen that is planned today functional now and during the next 10 to 20 years. It appears that the best way to plan for the future is to plan for flexibility, mobility, and room to grow.

Fads and unusual concepts should be dealt with cautiously. Sometimes, it is difficult to define these concepts. For example, in the mid-1980s some people may

have considered the salad bar a fad. However, the popularity of the self-service salad bars introduced in the 1980s is continuing into the 1990s, and the concept is working for both the customer and the food service operator.

At present, school district superintendents, local facilities' coordinators, and food service directors who are charged with planning the remodeling of an outdated food service facility or the building of a new one have few resource materials to guide them. This guide is intended to help those persons who are involved in planning such facilities.

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# ACKNOWLEDGMENTS

The *School Nutrition Facility Planning Guide* was prepared by Dorothy VanEgmond Pannell, author of *School Foodservice Management* (New York: Van Nostrand Reinhold, 1990).

The project leader was Caroline Roberts, Nutrition Education Specialist, Child Nutrition and Food Distribution Division, California Department of Education.

An advisory committee was formed to assist in the preparation of this guide. The committee was composed of child nutrition directors and administrators from school districts in California and staff of the Department of Education.

Committee members from school districts were selected on the basis of their expertise, interest, and involvement in the design of food service facilities in schools. These members represented agencies of varying sizes from differing regions of the state.

Committee members from the Department of Education were selected because of the relationship of their program areas of expertise to the development of food service facilities in schools.

"The input and ideas of all the committee members were essential to the comprehensiveness and success of this document," according to Project Leader Caroline Roberts.

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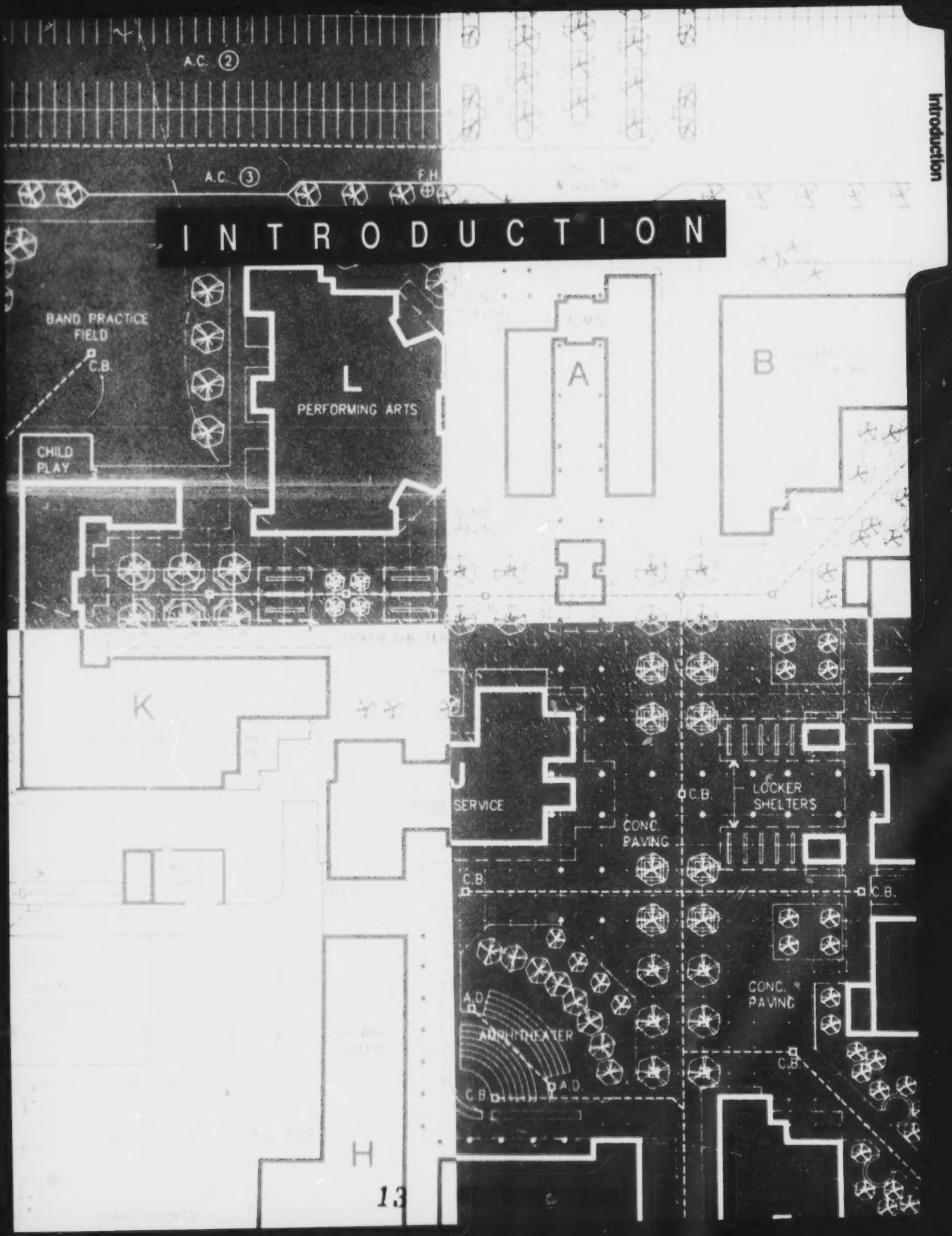
# INTRODUCTION



# INTRODUCTION

This guide is designed for use by child nutrition directors or other persons who are responsible for food services in schools.

## Purpose of the Guide

The guide is intended to:

- Facilitate the work of architects, engineers, and consultants in designing school food service facilities.
- Help school districts that do not have access to outside consultants to design a school kitchen.
- Help those who are new to school food service become familiar with the design process.
- Provide tips on what to consider in planning a food service facility.
- Provide checklists that child nutrition directors can use to prepare the basic information (see Section II) that architects will need to plan facilities and that directors can use to monitor progress during the construction phase.

This guide also describes food service systems, food production centers, food warehouses, and basic considerations of construction.

The guide does not provide specific recommendations on equipment and specifications, but Section XI does include a short discussion of these topics. For more detailed information see *A Guide for Planning and Equipping a School Food Service* (Washington, D.C.: U.S. Department of Agriculture, n.d.) and the many reference books on these subjects. NOTE: Use of this guide does not eliminate the need for a consultant for a food service facility.

## Role of the Local Facility Coordinator

Many school districts have a facility coordinator who is responsible for planning school facilities and for monitoring the building and remodeling of all school facilities. Some of the responsibilities of this person may be:

1. Coordinating the planning and construction of new schools and other facilities and alterations and additions to existing buildings
2. Acquiring land
3. Administering the collection of fees paid to the district by the developer
4. Meeting with community and educational groups and with individuals to determine the needs for facilities
5. Obtaining input from departments within the school district in regard to a facility's overall function and design
6. Selecting an architect
7. Reviewing architectural designs
8. Preparing specifications for construction and equipment bids
9. Implementing the policy decisions of the school district's governing board
10. As construction progresses, ensuring that the concerns of individuals who are responsible for the facility are addressed
11. Ensuring that the approved plans are being followed
12. Ensuring that inspections are satisfactorily completed and codes are followed

13. Coordinating payments on the completion of projects

## Role of the Local Child Nutrition Director/Manager

The local child nutrition director (manager if the food service system is not a centralized system) is a key individual in planning a new or renovated food service facility. The director's role includes the following:

1. Working with the local planning committee during the early stages of planning (Section I)
2. Determining the basic goals and objectives of the new or renovated food service facility (Section I)
3. Determining the basic operational concepts and philosophy of the food service program (Section II)
4. Providing the architect or consultant for the food service facility with pertinent information, such as a completed Food Service Facility Data form (Section II)
5. Providing input in the selection of a consultant for the food service facility
6. Providing input during the drawing of plans and during subsequent phases of the project
7. Carefully reviewing and recommending approval of the final architectural drawings
8. Providing information and details on equipment on request by the architect or the consultant for the food service facility
9. Monitoring progress during construction to ensure that needs are met
10. Checking the completed kitchen and its equipment and helping prepare a "punch list" (a list of incomplete items) for the school district's project coordinator. A checklist of items and factors to be included and the specifications for equipment are very helpful in this effort. (A sample checklist is found in Section XII.)
11. Scheduling demonstrations of equipment with the contractor and the food service employees
12. Recommending final approval when specifications are met and the items on the punch list are completed

## Role of the Architect

Once a school district selects an architect, that person or firm is responsible for:

1. Selecting a consultant for the food service facility, if specified in the contract, after receiving the input and/or agreement of the school district's food service director
2. Determining the needs of the food service facility with the assistance of the consultant and/or the director of the facility
3. Preparing the design and the specifications for the entire building
4. Selecting competent professional engineers and ensuring that engineering competence is maintained during the planning phases
5. Specifying materials and equipment within the budget restrictions
6. Revising specifications as necessary in accordance with change orders
7. Monitoring construction regularly to ensure that the building meets specifications

If a consultant is not designated, the architect will assume the responsibilities of a consultant.

## Role of the Food Service Facility's Consultant

The food service facility's consultant can assume many of the responsibilities listed earlier for the child nutrition director. The role of the consultant is to:

1. Consider the input of the child nutrition director.
2. Ensure that the facility's design will meet all needs.
3. With the child nutrition director or food service manager, determine the service system to be used and equipment preferences (see the Sample Food Service Facility Data Form, Section II).
4. Determine the amount of space needed for the facility.
5. Plan the efficient use of space.
6. Ensure that available funds are used to the best advantage of the food service program.
7. Determine the specific sizes and models of the equipment needed.
8. Develop specifications for equipment.
9. Plan the layout of equipment.
10. Help analyze the equipment bids.
11. Determine the quantities of hot water and electricity needed at peak times.
12. Provide the electrical, plumbing, and mechanical requirements and drawings to the engineers.

13. Ensure that the kitchen and its equipment are safe and functional.
14. Ensure that the equipment specified and accepted meets state and local codes and standards.
15. Check contractors' shop drawings for all installations of food service equipment.
16. Verify that electrical, plumbing, and mechanical services for equipment are in accordance with drawings.
17. Provide field supervision during the installation of equipment.
18. Prepare a punch list and change orders and ensure that the required corrections are made.
19. Inspect equipment and its installation to ensure that what was specified was received and that it was installed correctly and is functional.
20. Organize and provide a demonstration of equipment.

## Role of the Department of Education

The Child Nutrition and Food Distribution Division, California Department of Education, is responsible for providing guidance to school districts in the implementation of child nutrition programs. In addition to helping schools comply with mandates of federal and state child nutrition programs, the division is also committed to the efficient production of quality meals and the financial integrity of local programs. Properly designed food service facilities provide local child nutrition programs with (1) the potential for efficient use of staff and maximal productivity; (2) adequate space for appropriate storage and preparation of high-quality foods; and (3) the potential for effective use of state, local, and private funding.

The Department's School Facilities Planning Division assists school districts in funding and planning school facilities that are conducive to high-quality educational programs. It also functions as an educational advocate for school districts on school facilities issues and promotes research and development in the design, planning, and construction of school facilities. The School Facilities Planning Division is responsible for reviewing and approving sites that school districts propose to acquire for school purposes (*Education Code* Section 39101(a)). The division is also responsible for reviewing and approving plans prepared by school districts for new school buildings and plans for alterations and additions to existing school buildings (*Education Code* Section 39158).

# SECTION I

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S E C T I O N

# Steps in Planning a Kitchen Facility

The planning of a kitchen facility requires consideration in several areas, which are described below.

## A. Goals in the Planning Process

In designing a kitchen facility, planners should seek to:

1. Provide for an efficient kitchen with a minimal amount of floor space in which a minimal number of employees can prepare and serve specific numbers of optimum-quality foods in an established way.
2. Provide for proper equipment and adequate storage areas.
3. Plan wise use of construction funds.
4. Plan a facility that will be energy efficient.
5. Provide for a safe and comfortable working environment for employees.
6. Ensure that the facility will be easy to clean and maintain.

Knowing the difference between "just enough" and "too small" or "too large" is the key to a well-planned, efficient kitchen. According to Edward Kazarian, "A well-planned facility is developed by utilizing the basic principles from many areas of knowledge."[1] The areas that he refers to include the concepts of work analysis, time and motion studies, human engineering management, economics, psychology, and material handling. The planning objective is optimum use of money, materials, equipment, utilities, and labor.

The concept, design, space requirements, and arrangement of equipment that are ultimately planned for the food service areas will depend on the information that the architect and the food service facility's consultant receive.

## B. The Facilities Planning Process

The facilities planning process[2] developed by the School Facilities Planning Division (SFPD) lists 54 steps in the application process for state funding for building a facility. Twelve of the steps that may involve a child nutrition director and that are relevant to the general planning process are discussed below.

1. *Preliminary information-sharing and brainstorming session is conducted.* A preliminary information-sharing and brainstorming session is held to develop concepts. Participants will include those personnel who are responsible for planning, developing, and building the facility and other school personnel who will be affected by its construction and operation. At this time, the child nutrition director will report on his or her goals and ideas; the investigation of new developments in the field; and ideas gained from visiting other new facilities, by reading literature from companies that supply equipment, and by reading other books on the subject (see the references at the back of this guide). Child nutrition staff should be included in these sessions and tours of other facilities. Plans for the next five to ten years should be considered at this stage.

[1] Edward A. Kazarian, *Foodservice Facilities Planning* (First edition). New York: Van Nostrand Reinhold, 1975, p. 4.

[2] *Final Report of the Study of the School Facilities Application Process*. Sacramento: Joint Legislative Budget Committee, 1988.

2. *Planning committee is formed, and meeting is held to determine basic philosophy, goals, and objectives.* The planning committee should include community representatives and the school district's maintenance engineer, facilities coordinator, business manager, and child nutrition director or manager. A feasibility study may be necessary. Justifications must be submitted to the Department of General Services's Office of Local Assistance (OLA) for approval and funding if the facility is to be a state-aided project.
3. *Architect is selected.* The architect will select the design consultant for the food service facility if he or she is requested to do so by the child nutrition director. The director can be involved in approving the use of a specific consultant. Alternatively, the district can hire a consultant or ask the architect for evidence of his or her expertise in the design, planning, and construction of kitchens.
4. *Meeting is held to familiarize the architect, the food service facility's design consultant, and the planning committee with the basic philosophy, goals, and objectives of the project.* The child nutrition director or manager should meet with the food service facility's consultant (or with the architect if a consultant position is not established by contract) early in the planning stages to discuss the goals of the project. A Food Service Facility Data form (see the sample form in Section II) should be completed.
5. *Schematic design (preliminary drawings) and rough cost estimates are submitted by architect to Office of the State Architect (OSA), OLA, and the Department of Education's School Facilities Planning Division for approval if facility is to be state-funded.* Approvals by the State Fire Marshal and the California Occupational Safety and Health Administration (CAL/OSHA) are required for all school facilities. The food service director reviews and comments on the schematic design.
6. *Completed plans and specifications are submitted to OSA, OLA, and SFPD for approval if project is to be state-funded.* The checklist in Section XII, although intended for use in evaluating the facility after completion, can also be used at this stage by the child nutrition director to ensure that all aspects of the plans and specifications are considered and checked.
7. *Construction bid process is completed.* Typically, the district's director of facilities or the assistant superintendent for business services will oversee the bid process. Changes in the bid may be submitted as addenda.
8. *Construction, coordination, and inspections are completed.*

   During construction an inspector is responsible to the district for all work and the installation of equipment. Change orders to the original bid documents can prove to be expensive.
9. *Punch list is prepared by school district staff and/or food service facility's consultant.* Follow-through will be required to ensure that the corrections called for on the punch list are made.
10. *Demonstration of kitchen equipment is completed.* A demonstration of the kitchen equipment is coordinated by the food service facility's consultant or the contractor and the child nutrition director. Utility and ventilation controls should also be tested at this time.
11. *Final local and state audits are conducted and building certification is provided by OLA.* Local health and fire departments complete inspections.
12. *Facility is accepted as complete.*

## C. Regulatory Considerations

Throughout the planning stage, numerous regulations of several regulatory authorities have to be considered:

1. The Department of Health Services (see the California Uniform Retail Food Facilities Law [CURFFL] in Appendix A)
   a. Hand-washing facilities
   b. Rest room facilities
   c. Hot water supply
   d. Type and location of refuse disposal
   e. Type of lighting and levels of illumination
   f. Ventilation
   g. Fly, vermin, and rodent control
   h. Walls, ceilings, and floors
2. *California Code of Regulations, Title 21, Public Works,* and parts 1–5 of *Title 24, State Building Code*

3. Local health and fire codes
4. Fire Protection Association
5. National Sanitation Foundation (NSF)
6. CAL/OSHA
7. County environmental health departments, local air pollution control and air quality management districts, and the U.S. Environmental Protection Agency
8. Underwriters' Laboratories (UL) and Factory Mutual (FM) testing agencies

Although a school district may not need a local building permit or undergo local inspections during the building process, it is the local agencies that inspect the facilities when they are completed; e.g., health department and fire department. For these reasons, the facilities should meet not only the national and state codes but also local requirements, which can be more stringent.

## D. Financing

Financing is a major consideration for planners of food service facilities. Funds may be provided entirely by local sources or by the state, or they may come from a combination of local and state sources. If state funding is involved, the drawdown of funds is based on phases of completion. The funding requirements may be complicated and may be unique to the school district. It is important for the child nutrition director to know not only how much money is available but also the sources of funds and for what purposes the monies from each source can be used. The business or fiscal manager can assist in identifying resources available for funding.

The School Facilities Planning Division reported in 1988 that the average construction cost for classrooms was $125 per square foot and for food service facilities, $200 per square foot, excluding site acquisition and equipment costs. Appendix B provides a list of equipment (and approximate equipment costs in 1988) that state funds cover. The food service director will need information on current funding levels as described below:

1. *Central kitchen.* State funds can be used to finance a central kitchen. The definition of *central kitchen* in this case is a kitchen providing food for more than one site.

   In May, 1988, the State Allocation Board approved regulations that allow state monies to be used to equip and furnish a central kitchen in the following amounts based on the number of lunches to be served per day:

| Number of lunches to be served per day | Allowance |
|---|---|
| Up to 5,000 (ten schools) | $305,000 |
| 5,000–10,000 (20 schools) | $490,000 |
| 10,000–15,000 (30 schools) | $675,000 |
| **or** | |
| lump sum | $50,000 (plus per capita allowance) |

   Districts may elect to receive a lump sum. If the lump sum option is chosen, they receive a baseline amount of $50,000 and the following amounts are added to the lump sum: $60 for each of the first 2,000 students served; $25 for each student served in excess of 2,000; and $6,000 for each serving kitchen that is serviced.

   As noted above, state funds are not available unless the proposed central kitchen would serve at least two sites.

2. *Costs chargeable against the school district's funds.* According to Section 39900 of the *Education Code*, the cost of housing and equipping cafeterias is chargeable against the general fund of the school district. However, if the governing board of a school district deems it necessary, the board may charge against the cafeteria fund the cost of the lease or purchase of additional cafeteria equipment for a central kitchen, food processing plant, or commissary (referred to as food production centers in this guide). The board may also charge the cost of vending machines and their installation and housing against the cafeteria fund. If a school district expends general funds for the lease or purchase of additional cafeteria equipment for a central food processing plant (or for the lease, purchase, installation, or housing of vending machines), the governing board may, at anytime within five years after the expenditure, repay the district's general fund from the cafeteria fund.

3. *Restrictions on the use of cafeteria funds.* In accordance with federal regulations, child nutrition funds shall not be used for the purchase of land or buildings or for construction of food service facilities. All revenue and income accrued on behalf of the breakfast or lunch programs are so restricted.

   Section 39890 of the *Education Code* provides for the permissive establishment of a cafeteria fund as

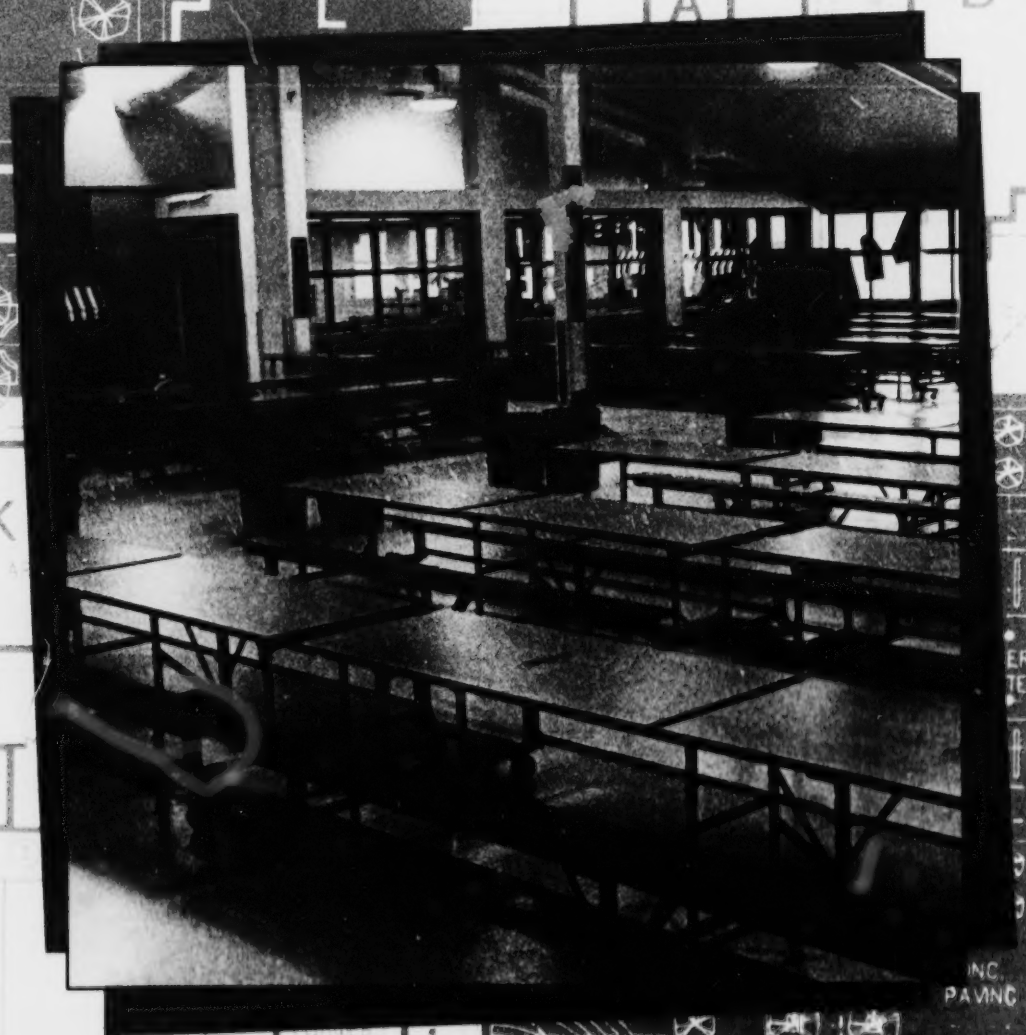
follows: Money received for the sale of food or for any services performed by the cafeteria may be paid into the county treasury to the credit of the "cafeteria fund" of the particular school district.

Section 39891 of the *Education Code* provides for the restrictive use of Cafeteria Fund as follows:

> The cafeteria fund shall be used only for such expenditures as are necessary for the operation of school cafeterias. However, when the governing board deems it necessary, it may make expenditures from the cafeteria fund for the lease or purchase of additional cafeteria equipment for the central food processing plant, and of vending machines and their installation and housing.
>
> The governing board of any school district, or of two or more school districts governed by governing boards of identical personnel, may also make expenditures from the cafeteria fund for the construction, alteration, or improvement of a central food processing plant [food production center] for the installation of additional cafeteria equipment for the food processing plant [or food production center], and for the lease or purchase of vehicles used primarily in connection with the food processing plant [or food production center].

In accordance with *Education Code* sections 39890–39902, only equipment for a cafeteria, a food service warehouse, food service offices, or a food processing plant (food production center) can be purchased from cafeteria funds, including federal funds. At times, federal dollars are designated for the purchase of equipment, as was the case in the late 1960s and most of the 1970s, and is the case in the early 1990s for the purpose of establishing breakfast programs in schools.

# SECTION II



S E C T I O N

# Preliminary Information Needed for Planning a Facility

The importance of early planning should not be underestimated. The type of food service system to be used determines the facility's design and equipment. These decisions should be made by the school district's planning committee and food service director and should not be made solely by the food service facility's consultant or the architect.

Factors to consider in early planning include the type of food service system to be used, the types of food service programs to be offered, the types of dishware and utensils to be used, storage needs for donated foods from the U.S. Department of Agriculture (USDA), and the collection of data for the food service facility. Each of these factors is addressed in this section.

## A. Type of Food Service System to Be Used

The food service system that is to be used by a school district is generally determined by the school district's planning committee and the child nutrition director and approved by the governing board. The availability and cost of labor to operate the facility should be considered in the determination of which system is to be used.

*Food service system* may be defined as the overall performance plan of a school or school district for carrying out its food service programs.

Many systems have been developed over the years, some out of necessity, by school districts. School districts usually use more than one system. Food service systems most often used by schools include the (1) conventional food system (self-contained kitchen); (2) convenience food system (assembly/serve); and (3) satellite system—food is prepared at a central kitchen (base kitchen) or a food production center. Each system is described in greater detail below.

1. *Conventional food system.* A conventional food system, often referred to as the traditional or self-contained kitchen, is one in which food is prepared and served at the same site. This is the most common system used, and many school districts prepare more than half of their food from raw ingredients. The advantages and disadvantages of such a system are as follows:

   **Advantages:** (1) Schools are not dependent on other sites for food; (2) the system is more adaptable to individual schools' preferences; (3) the system provides for more flexibility; (4) food appears and/or tastes fresher because it can be prepared closer to the time of service; and (5) kitchen/cooking facilities are available at each site for use by other community groups.

   **Disadvantages:** (1) A greater number of skilled employees are required; (2) productivity is lower; (3) the cost of labor and/or food is generally higher; (4) space and a fully equipped kitchen are required; and (5) quality varies from one school to another, depending on the skills of each school's food service employees.

2. *Convenience food system.* A convenience food system is also referred to as the *minimal cooking concept*, the *ready-prepared food system*, and the *assembly/serve food system*. Processed foods are used in this system. Food is purchased ready for portioning or packaging and for serving on-site or

at a remote site. A convenience food system offers the following advantages and disadvantages:

**Advantages:** (1) Fewer employees are required than in a conventional system; (2) less preparation equipment is required; (3) there is usually little or no food waste in preparation; (4) a less-skilled labor force is required; and (5) meal quality is more easily standardized.

**Disadvantages:** (1) Food costs are higher; (2) using USDA commodities is more difficult; (3) usually, more dry and freezer storage space is required; (4) there is increased trash from packaging; (5) control at the site is lessened (can be an advantage because the foods served may be more consistent in quality); (6) the "home-cooked" appearance and taste of food may be lost; and (7) the stigma of "TV" dinners may be present.

3. *Satellite food system.* In the satellite food system, food is prepared at one location and transported in bulk (cold, frozen, or hot) or preplated (ready to serve or ready to be heated) to another location. The food may be purchased already prepared from a commercial company, or it may be prepared by the school food service, in which case one of the following types of kitchens is necessary:
   a. Food production center—A large facility that orders, receives, and prepares food for transportation to several other sites (satellite units) for final preparation or heating and/or serving (see Section IX)
   b. Central kitchen (base kitchen)—A kitchen within a school that prepares and serves food on the premises and prepares food for two or more locations

   The advantages and disadvantages of a satellite food system are as follows:

   **Advantages:** (1) Cost savings can be realized from centralized purchasing; (2) less labor, inventory, and equipment may be needed; (3) fewer skilled employees are needed; (4) the quality of the food is usually more standardized; and (5) the construction of a central kitchen and food service production center may qualify the district to receive state construction funds.

   **Disadvantages:** (1) Specialized equipment and vehicles are required for transporting food; (2) transportation costs are increased; (3) weather conditions could affect the availability of food at satellite sites;[1] (4) food safety may be more difficult to maintain when food is transported from one location to another; and (5) food service may be less flexible at the serving school if meal counts and changes in schedules are factors. However, if the cook/chill method is used, the safety and quality of the food should not be affected.

   Satellite schools may have one of the following types of kitchens:
   a. Receiving kitchen—A kitchen that receives prepared food, which may or may not be portioned, that is ready to serve
   b. Finishing kitchen—A kitchen that receives prepared food ready for reconstitution (heating) and serving (food may or may not already be portioned when received)

## B. Types of Food Service Programs

The types of food service programs and the menus to be offered determine to a great extent what equipment will be needed, the amount of space that will be required, and the costs that will be incurred. The types of food service programs to be provided may include one or more of the following:

1. *Breakfast program.* The federal breakfast program is provided in 25 percent of California's schools. A "reimbursable breakfast" is one that qualifies for federal and state reimbursements to the district.
2. *Lunch program.* Most school districts in California provide complete, nutritious lunches and are reimbursed from state and federal funds. A "reimbursable lunch" is one that meets state and federal regulations.

   The lunches are priced as units and must meet the requirements of the National School Lunch Meal Pattern, which were once known as the "Type A" lunch requirements.
3. *Snack and a la carte programs.* The greatest variance among school districts' food programs is in the variety and volume of snacks and a la carte offerings. A la carte sales may be limited to milk or may extend to a large variety of foods.

   Providing snacks in kindergarten and/or after-school extended-care programs may be a service provided by the school's food service facility.

[1] Weather conditions will not be a factor if the cook/chill method is used and the food is delivered and stored at the satellite kitchen one to two days ahead of time.

4. *Catering*. Catering special functions and special events has become a source of income for some school food service programs. (Storage space for catering equipment may need to be considered.)
5. *Other services*. Some school districts provide food for other governmental programs outside the districts' schools, such as nutrition programs for seniors, Meals on Wheels, day care programs, Head Start, other preschool programs, and summer food service programs.

## C. Types of Dishware and Utensils

An important decision to be made in the early stages of planning a new facility is whether dishware and utensils are to be disposable or permanent. Permanent dishware and utensils may not be the better choice, because of the water needed for washing and because of the necessity of putting detergents into the environment. A cost comparison between the two options would be valuable for personnel who will make this decision. Pros and cons to both alternatives are listed in Table II-1.

## D. The U.S. Department of Agriculture's Donated Foods

Storage needs will be influenced by the quantity of foods received from the U.S. Department of Agriculture. In 1987, a substantial proportion (as much as 30 percent) of the foods used by school food services that were participating in the National School Lunch Program were provided by the federal government. Today, the proportion is approximately 20 percent. The foods provided by the USDA come in a variety of forms, from raw ingredients—fresh, frozen, canned, or dried—to prepared frozen portions of food that are ready to heat and serve.

Adequate storage at the proper temperature is a requirement for a district to participate in the donated-food program, and it must be considered in the planning of a facility. (See Table II-2 for the recommended storage times and temperatures.)

## E. Food Service Facility Data

Once the above decisions are made and during the early stages of planning a new school or renovation, the child nutrition director will need to provide the food service facility's consultant (or architect, if no consultant is designated) with basic information about the program. A completed Food Service Facility Data form, such as the sample in Figure II-1, should contain the information that is needed by those planning and preparing specifications for the food service facility and its equipment. Such a form should be completed by the food service director or by the director with input from the facility's planning officer and the food service facility's consultant. The information contained in this guide will be helpful in completing this form.

During the early stages of planning, there should be a clear vision of the completed facility, and details of that vision need to be communicated to those persons involved in its design and construction. In addition to the information provided in the Food Service Facility Data form, it would be helpful to examine the items listed in the Checklist for Completeness of Facility (see Section XII) during the early stages of planning.

**TABLE II-1**

**Pros and Cons of Permanent and Disposable Dishware and Utensils**

| *Permanent dishware and utensils* | *Disposable dishware and utensils* |
|---|---|
| **Pros** | **Pros** |
| • Are aesthetically more appealing<br>• Are more desirable to some users<br>• Will reduce trash disposal problems<br>• Could reduce spills | • Are labor-saving<br>• Are more sanitary and may reduce the spread of germs<br>• Are used by fast-food restaurants, and most students are, therefore, familiar with them<br>• Will result in lower costs for energy and detergents<br>• Will reduce noise levels in school cafeterias |
| **Cons** | **Cons** |
| • Will require purchase of costly replacement equipment<br>• Will increase the costs for energy (electricity, gas), water, and detergent<br>• Will result in replacement costs for dishes, trays, and flatware because of breakage, loss, and theft<br>• Will significantly increase water usage<br>• Will result in labor costs for operating dish-washing equipment and monitoring inventories to prevent loss<br>• Will require finding workers for hard-to-fill positions of dishwashers<br>• Will cause difficulty in maintaining high sanitation standards | • Will increase trash disposal problems<br>• Will create ecological concerns<br>• May meet with opposition from students, parents, and members of the community<br>• Will create usage problems—not as sturdy—especially for small and/or handicapped students<br>• Will require considerable storage space<br>• Could cause a fire hazard |

**TABLE II-2**

**Recommended Storage Temperatures and Times for USDA-Donated Foods**

| Commodity | Dry storage | | Refrigerated storage (Relative humidity less than 60 percent) | | Comments |
|---|---|---|---|---|---|
| | Temperature range in °Fahrenheit (°Celsius)[a] | Recommended maximum storage period (in months)[b] | Temperature range in °Fahrenheit (°Celsius)[a] | Recommended maximum storage period (in months unless noted otherwise)[b] | |
| **Dairy products** | | | | | |
| Butter | — | — | 32°–45° (0°–7.2°) | 4 weeks | Freeze if held longer than two weeks. |
| Cheese, cheddar, block | — | — | 32°–45° | 12 | Must be held at constant temperature |
| Cheese, mozzarella | — | — | 32°–45° | 12 | and in original container. Freeze |
| Cheese, processed | — | — | 32°–45° | 12 | only if necessary. Freeze *quickly;* |
| Milk, nonfat, dry | Under 70° (21.1°) | 9 | 32°–45° | 24 | thaw *slowly* in refrigerator. |
| **Fruits** | | | | | |
| Apples, fresh | — | — | 32°–45° | 3 | |
| Fruit, canned | Under 70° | 24 | 32°–45° | 48 | |
| Fruit, dried | Under 70° | 9 | 32°–45° | 18 | |
| Fruit, frozen | — | — | 0° (–17.8°) or below | 18 | |
| Pears, D'Anjou, fresh | — | — | 29°–31° (-1.7°–0.6°) | 2–3 months | |
| **Grain products** | | | | | |
| Bulgur | Under 70° | 3 | 32°–45° | 6 | |
| Cornmeal | Under 70° | 12 | 32°–45° | 24 | |
| Flour, all-purpose | Under 70° | 12 | 32°–45° | 24 | |
| Flour, bread and whole-wheat | Under 70° | 12 | 32°–45° | 24 | |
| Oats and wheat, rolled | Under 70° | 12 | 32°–45° | 12 | |
| Rice, white | Under 70° | 20 | 32°–45° | 30 | |
| **Pasta products** | | | | | |
| Macaroni | Under 70° | 36 | 32°–45° | 72 | |
| Spaghetti | Under 70° | 36 | 32°–45° | 72 | |
| **Fish, meat, and poultry products** | | | | | Avoid excessive moisture. |
| Chicken, whole or cut-up, frozen | — | — | 0° (–17.8°) or below | 8 | |
| Fish and meats, canned | Under 70° | 18 | 32°–45° (0°–7.2°) | 36 | |
| Ground beef patties, frozen | — | — | 0° (–17.8°) or below | 6 | |
| Ground meats, frozen | — | — | 0° or below | 9 | |
| Turkey roasts, ready-to-cook, frozen | — | — | 0° or below | 7 | |
| Turkey, whole body, frozen | — | — | 0° or below | 9 | |

**TABLE II-2** *(continued)*

| Commodity | Dry storage | | Refrigerated storage (Relative humidity less than 60 percent) | | Comments |
|---|---|---|---|---|---|
| | Temperature range in °Fahrenheit (°Celsius)[a] | Recommended maximum storage period (in months)[b] | Temperature range in °Fahrenheit (°Celsius)[a] | Recommended maximum storage period (in months unless noted otherwise)[b] | |
| **Miscellaneous** | | | | | |
| Egg mix, dried | Under 70° (21.1°) | 12 | 32°–45° (0°–7.2°) | 15 | Avoid excessive moisture. |
| Honey, canned | Under 70° | 24 | — | — | |
| Nuts, bulk | — | — | 32°–45° | 12 | |
| Peanut products, canned | Under 70° | 18 | 32°–45° | 36 | |
| Vegetable oil | Under 70° | 12 | 32°–45° | 24 | |
| Vegetable shortening | Under 70° | 24 | 32°–45° | 48 | |
| **Vegetables** | | | | | |
| Beans, dry | Under 70° | 12 | 32°–45° | 24 | |
| Potato flakes, dehydrated | Under 70° | 12 | 32°–45° | 24 | |
| Vegetables, canned | Under 70° | 24 | 32°–45° | 48 | Avoid excessive moisture. |
| Vegetables, frozen | — | — | 0° (–17.8°) or below | 9 | |

[a]Suggested temperatures do not preclude contamination by rodents and insects, assuming that storage is in original unopened containers.
[b]Length of storage period is in relation to packing date.

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## Food Service Facility Data

Date:

Name of project:

Address:

Name of school district:

School district's project director:

Address:

Telephone:

Child nutrition director or contact person:

Address:

Telephone:

Architect:

Address:

| Telephone: | Representative: |
|---|---|

Food facility design consultant:

Address:

| Telephone: | Representative: |
|---|---|

Mechanical engineers:

Address:

| Telephone: | Representative: |
|---|---|

Electrical engineers:

Address:

| Telephone: | Representative: |
|---|---|

| Project dates:<br>Design completion: | Bidding: |
|---|---|
| Construction beginning date: | Construction completion date: |

Restrictions:

Food service facility budget:

Others:

**Figure II-1**

**Sample Food Service Facility Data Form**

**Fig. II-1** *(continued)*

1. Potential customers — *Present* — *Future*

School enrollment _____ _____

School grade levels _____ _____

Estimated maximum number of daily customers

| | *Breakfast* | *Lunch* | *A la carte* | *Other* |
|---|---|---|---|---|
| Students | | | | |
| Staff | | | | |
| Others | | | | |
| Totals | | | | |

Number of lunch periods _____ Length of lunch periods _____ _____

Largest number of customers to be seated at one time _____

Number of vending machines _____ Open campus (Indicate yes or no.) _____

Student stores (Indicate yes or no.) _____

Other types of sales conducted by students or adults _____

Other eating facilities on and off the campus _____

2. Type of kitchen

Food preparation systems (Check (✔) one.)

- ☐ On-site production and service
- ☐ Preparation for self and others and service
- ☐ Finishing

Receiving or serving (Check (✔) one.)

- ☐ Bulk hot
- ☐ Bulk refrigerated for heating and serving
- ☐ Preplated
- ☐ Ready-to-serve
- ☐ Refrigerated for reheating and serving

Food production center (produce food only)

☐ Bulk ☐ Hot ☐ Cook/chill ☐ Cook/freeze

☐ Preplated ☐ Hot ☐ Cold

Will facility be used by others? _____ How often? _____

Typical size of groups that will use facility _____

Type of food preparation _____

Access to storage and equipment _____

**Fig. II-1** *(continued)*

3. Menus

Type of menu: Choice ☐ Limited choice ☐ Offer vs. serve ☐

Food bars _____ Snacks _____

Selection and number of items (daily)

Entrees _____ Sandwiches _____

Vegetables _____ Salads _____

Breads _____ Beverages _____

Desserts _____ Fruits _____

Attach typical menus for five days. Indicate items that will be prepared using raw ingredients with "R" and convenience items with "C."

4. Type of preparation to be done in kitchen (Indicate products to be used and method of preparation.)

| *Food* | *Basic (raw) ingredients* | *Mixes* | *Ready-to-serve* |
|---|---|---|---|
| Bread (sliced, french)<br>Rolls<br>Muffins, biscuits, and so on<br>Pastry items | | | |

Method of cooking (Check (✔) as many as are applicable.)

| *Food* | | *Grill* | *Fry* | *Steam* | | *Bake (oven)* | *Top of range* |
|---|---|---|---|---|---|---|---|
| | | | | *Steamer* | *Kettle* | | |
| | Fruit | | | | | | |
| Meats/other entrees | Chicken/poultry | | | | | | |
| | Hamburgers | | | | | | |
| | Chops, cutlets | | | | | | |
| | Pizza | | | | | | |
| | Sauces/gravies | | | | | | |

Will batch cooking be done? _____

Large-volume cooking? _____

**Fig. II-1** *(continued)*

5. Purchasing policy

In what size units (sacks, crates, cases, and so on) and in what condition (fresh, frozen, canned/shelf stable) is food purchased? What is the frequency of delivery?

| | *Fresh* | | *Frozen* | | *Canned/ shelf stable* | |
|---|---|---|---|---|---|---|
| *Item* | *Purchase units* | *Frequency of delivery* | *Purchase units* | *Frequency of delivery* | *Purchase units* | *Frequency of delivery* |
| Potatoes | | | | | | |
| Fruits | | | | | | |
| Vegetables, cooked | | | | | | |
| Meats | | | | | | |
| Poultry | | | | | | |
| Baked goods | | | | | | |
| Dairy products | | | | | | |
| USDA-donated foods | | | | | | |

How frequently is produce delivered? _____

Which single-service disposable items are used?

(Check (✔) all applicable items.)

- ☐ Straws
- ☐ Napkins
- ☐ Hot cups
- ☐ Cold cups
- ☐ Bowls
- ☐ Plates
- ☐ Trays
- ☐ Sandwich wrap or bags
- ☐ Pan liners
- ☐ Aluminum foil pans

6. Type of refrigeration equipment

Refrigerator

- Reach-in _____
- Walk-in _____
- Reach-through _____
- Roll-through _____

Freezer

- Reach-in _____
- Walk-in _____
- Ice cream cabinet _____
- Milk shake machine _____
- Ice machine _____

**Fig. II-1** *(continued)*

7. Source of equipment

   Is any existing equipment to be supplied by the school district?

   If yes, attach a list of the items and include gas and/or electrical, water, and plumbing requirements.

8. Types of service (Check (✔) all that are applicable.)

| | *Full-service* | *Self-service* |
|---|---|---|
| Snack shop or snack bar | _____ | _____ |
| Breakfast | _____ | _____ |
| Lunch | _____ | _____ |
| Other (List.) _____ | _____ | _____ |

   Self-service bars (Check (✔) all that are applicable.)

   Salad ☐ Taco ☐ Pasta ☐ Dessert ☐ Potato ☐ ☐ Other (List.) _____

   Serving method (Check (✔) all that are applicable.)

   ☐ Straight serving line for cafeteria-style service
   ☐ Carousel or rotating serving line for self-service
   ☐ Scramble style
   ☐ Vending machines in food service area
   ☐ Window-style service
   ☐ Conveyor-style service
   ☐ Self-service speed line

9. Dining/eating area (Check (✔) all that are applicable.)

   ☐ Inside the building ☐ Outside the building ☐ Both

   Seating capacity

   Commons area _____ Dining room _____

   Multipurpose room _____ Faculty/staff dining room _____

   Total _____

   Where are condiments located? _____

10. Use of facility

    Hours of service

    Breakfast _____

    Lunch _____

    Number of lunch periods _____

    Is service continuous? _____

    Payment methods (Check (✔) all that are applicable.)

    Cash ☐ Tickets ☐ Computer-scanned cards ☐ ☐ Other (List.) _____

    Will the facility be used for evening functions? _____

    If so, is the dining area accessible from an outside entrance? _____

    Is the kitchen to be locked off from visitors who are using other facilities? _____

**Fig. II-1** *(continued)*

Below, list special considerations for preparation, service equipment, or layout.

_____

_____

_____

_____

_____

_____

11. Sanitation

Items to be washed _____

Sanitation equipment to be used (Indicate yes or no.)

Dish washing _____ Low temperature/chemical _____

Hot water sanitizing _____

Waste disposal systems to be used (Indicate yes or no.)

Garbage disposal _____

Compactor _____

Cans/dumpster _____

Frequency of trash pickup _____

Is trash storage space needed? _____

Pot and pan washing (Indicate yes or no.)

Low temperature _____

Hot water sanitizing _____

Three-compartment sink _____

Automatic pot-pan-washing machine _____

Can washing location

In food service area? _____

Other location (Indicate.) _____

Is a custodian's closet required near the kitchen? Yes ☐ No ☐

Clothes washer: Yes ☐ No ☐ Dryer: Yes ☐ No ☐

12. Employees' facilities (Check or answer as appropriate.)

Time clock ☐ Time card holders ☐

Number of hand sinks _____ Location _____

Lockers ☐ If yes, how many? _____

Are separate rest rooms required for male and female employees? _____

Number of employees on duty during peak hours _____

Is an office required for the manager? _____ For other staff? _____

Is an employees' break area required? _____



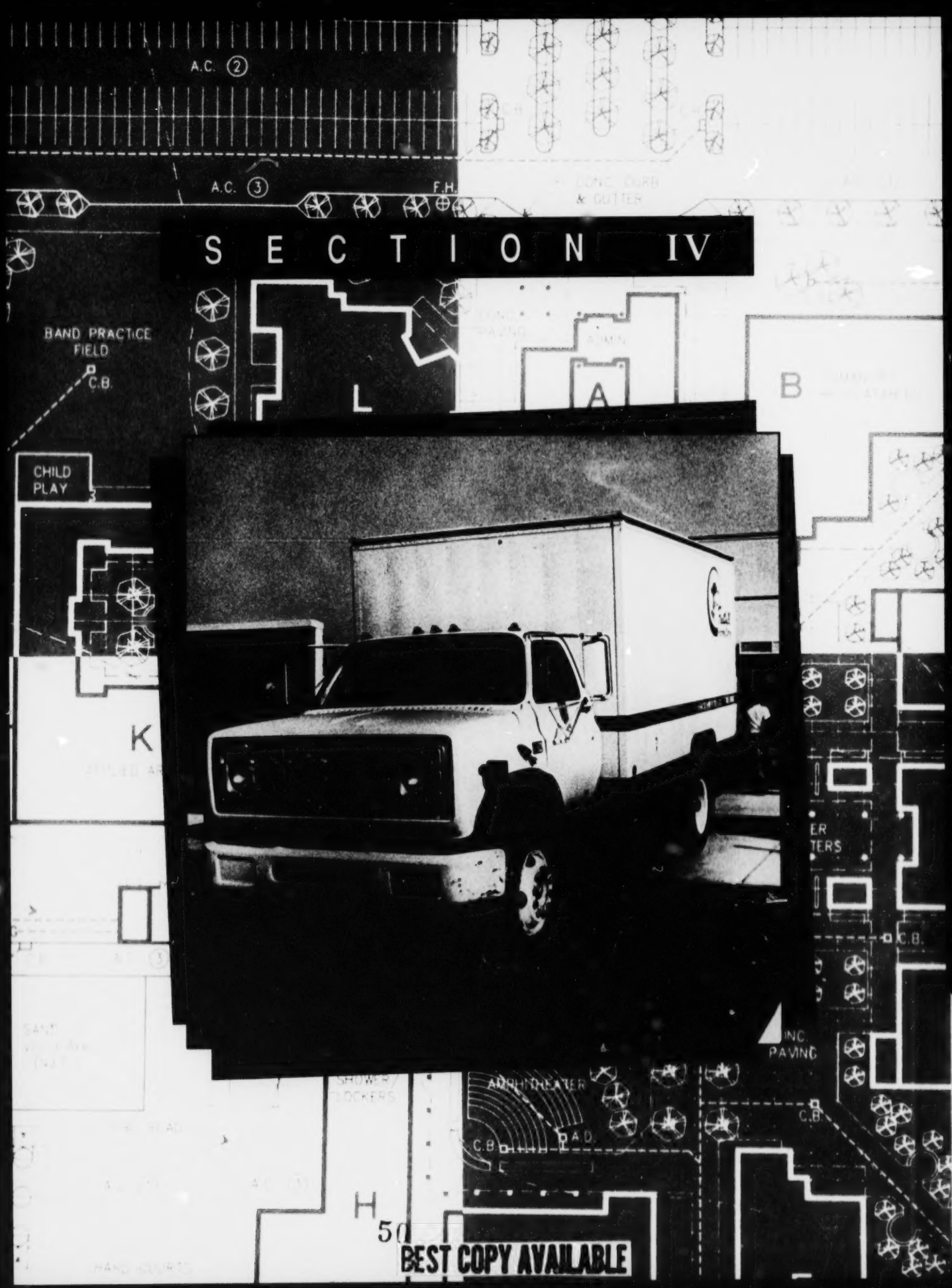


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**Fig. II-1** *(concluded)*

13. Materials to be used

Floor material _____ Wall material _____

Ceiling material _____ Height of ceiling _____

14. Heating, ventilating, and air-conditioning

Will air-conditioning be installed in the:

Kitchen? _____ Office? _____ Dining room? _____

Is the storeroom to be maintained at a specific temperature year-round? _____

Required temperature _____

Is a steam source required that is separate from equipment? _____

Ventilation type to be used (Check (✔) all that are applicable.)

Back shelf ☐ Canopy ☐ Vapor hood ☐

Fuel preference for cooking:

Gas (natural ☐ or LP ☐) Electricity ☐

15. Satellite or finishing kitchen (complete only if applicable)

Do transport containers require outlets? _____ How many? _____

Dock height needed _____

Amount of storage space needed at the site (Complete only if applicable.)

Refrigerator _____ Freezer _____ Dry _____

Will cooking or heating of food be done on site? _____

16. Production kitchen for other schools (Complete only if applicable.)

Preparation for how many sites? _____

Total number of meals _____

Distance from production kitchen to farthest receiving kitchen or school _____

Preparation and transportation methods

Bulk hot ☐ Bulk cooked ☐ Steam table pans ☐ Chill pack bags ☐

Individual portions ☐ Hot ☐ Cold ☐

Carts and carriers

Maintain hot. ☐ Maintain cold. ☐ Maintain frozen. ☐

If carriers require electrical outlets, how many? _____

Method of transportation _____

Truck bed's height _____

Number of trucks to be accommodated

At receiving dock _____ At loading dock _____

# SECTION III

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S E C T I O N

# Structural Considerations

Planners must consider many structural factors when designing the food service facility: locations; space allocations; building materials; lighting; sound-levels; cooking fuels; sources of steam; heating, ventilation, air-circulation, and cooling; fire protection; water temperature, pressure, and quantity; plumbing; and electricity. Each is discussed in this section.

## A. Locations

Convenient access should be a design consideration.

1. *Kitchen's location.* A food preparation or serving kitchen should be located:
   a. Convenient to an adequate, direct service driveway that can accommodate heavy delivery trucks
   b. Away from school traffic, playgrounds, and the school's main entrance
   c. Near an outside entrance and in some cases near a loading platform or dock

   Parking and lighting for food service employees should be provided near the entrance to the kitchen. (See sections IV, V, VI, VII, and VIII for additional discussions of kitchen arrangements.)

2. *General arrangement.* The food preparation or serving kitchen should be planned to allow for the flow of food and related materials from the loading platform to a receiving area, to the storage areas, and then to the preparation and serving areas. This flow should be as direct as possible (see Figure III-1).

   The kitchen should have direct access to the receiving area, garbage and trash areas, custodial closet for mops, the employees' locker room(s) and rest room(s), food storage areas (both dry and refrigerated), serving area, and dish-washing area. There should be easy access between the serving and dining areas.

3. *Dining areas.* Dining areas should be adjacent to the kitchen and on the same floor level. There should be easy access to the dining areas from the classroom areas. Questions to be answered in planning the dining area are (a) Will the eating areas be inside, outside, or both? (b) Will the staff's dining area be separate from the students' dining area? (c) Will permanent or disposable dishware

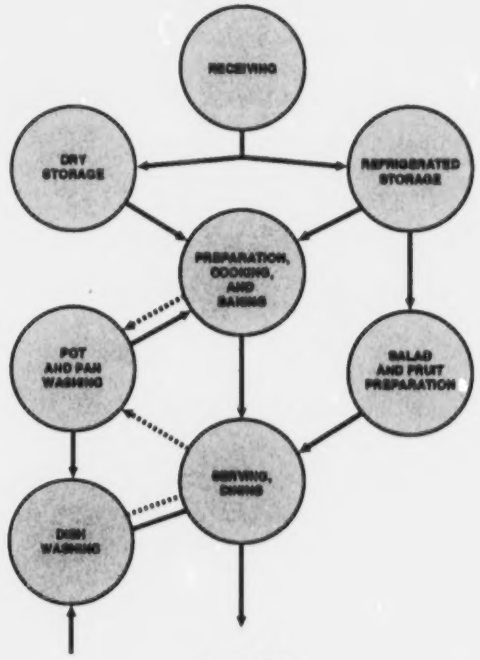



**Figure III-1**
**Recommended work flow in a food service facility**

*Source:* Dorothy VanEgmond Pannell. *School Foodservice* (Third Edition). New York: AVI Publishing, 1985.

and utensils be used? (The configuration of rooms in the facility will be affected by this choice.) (d) Will the dining space be used for other purposes, such as study hall, students' common area, and multipurpose room? and (e) What atmosphere is to be created in the dining area? The dining space should be designed to encourage a social atmosphere that is conducive to good eating, even if the space is also intended for other uses. It should be attractive, brightly colored, cheerful, and as noninstitutional as possible.

Dining areas should be designed so that (1) traffic leaving the dining area passes close by the dishwashing and trash disposal areas; (2) customers in line to return dirty dishes will not cross with serving line traffic; and (3) the entrance to the serving area will be convenient to the entrance to the dining area.

In the development or evaluation of layouts, a schematic, such as the flow chart in Figure III-1, should be used to examine work flow and traffic patterns. (See Section VI for further information on planning the dining area.)

## B. Large, Fixed Equipment

The fixed equipment, such as cooking equipment, dishwasher, walk-in refrigerator, and mixer, can be obtained in several different ways, as shown in Table III-1. (See Section XI for further discussion of procurement options.) The advantages of having the contractor purchase and install the equipment are:

1. The food service facility's consultant can write the equipment specifications as well as the mechanical and plumbing specifications.
2. The contractor can coordinate the delivery and installation of the equipment.
3. The contractor is responsible for the installation of the equipment in compliance with applicable codes and with the approval of all regulatory agencies.
4. The contractor is responsible for the replacement of damaged or stolen equipment.
5. The contractor is responsible for equipment that does not work after installation.

Contractor's fees will be saved if the school district purchases the equipment directly. However, if the school district purchases the equipment, specifications must be prepared for the architect for electrical, plumbing, water, and gas connections. Coordinating the timely arrival of the new equipment with the contractor's schedule may be a major challenge.

**TABLE III-1**

**Options for Purchasing and Installing Equipment**

| *Option* | *Provider* | *Installer* |
|---|---|---|
| 1 | School district[a] | Contractor |
| 2 | School district[a] | School district |
| 3 | Contractor | Contractor |

[a]Provides all or some.

## C. Space Allocation

The Department of Education's School Facilities Planning Division has established typical and approximate space allocations for use in planning construction that is to be funded with state aid (see Table III-2).

If a school district is using local funds, approval may be obtained for 10 percent more space than that established by the School Facilities Planning Division.

**TABLE III-2**

**Space Allocations Required for Kitchen and Multipurpose Facilities in Order for a Project to Qualify for State Aid**

| *School level* | *School building sq. ft. (sq. m) per child* | *Multipurpose/ kitchen sq. ft. (sq. m) per child* |
|---|---|---|
| Elementary (K–6) | 59 (5.5) | 7 (0.6) |
| Junior high (7–8) | 80 (7.4) | 7 (0.6) |
| High (9–12) | 92–113 (8.5–10.5) | 8 (0.7) |

Examples of required square footage for multipurpose and kitchen facilities for a project being funded with state aid follow:

- Elementary school—32 classrooms, 600 students: 4,200 sq. ft. (386.4 sq. m)
- Junior high school—37 classrooms, 800 students: 5,600 sq. ft. (515.2 sq. m)
- High school—40 classrooms, 1,800 students: 14,400 sq. ft. (1324.8 sq. m)

The space needed for food preparation, meal service, and dining depends on the (1) ages of students; (2) anticipated enrollment; (3) food service system that is planned (less space will be needed for a receiving or serving kitchen than for a production

kitchen); (4) types of menus and choices to be offered; (5) number and length of lunch periods; (6) percentage of students who are expected to be served; and (7) other uses to be made of the facility.

A general guide to the space needed in a conventional (production) kitchen and in dining areas is provided in Table III-3. A serving kitchen and finishing kitchen will require less space than a central kitchen that produces food for other schools. Appendix D contains a kitchen blueprint that illustrates the use of space.

1. *Kitchen.* The kitchen should be planned for compactness and efficiency. Time and motion principles should be applied in all phases of the planning process. In applying these principles, planners should:
   a. Avoid designs that will result in crisscrossing traffic patterns and unnecessary steps.
   b. Avoid designs that will result in congested work areas.
   c. Promote a continual flow of food toward the serving areas.
   d. Ensure that equipment is placed in the sequence of use.
   e. Ensure that supplies are placed for the convenience of personnel.
   f. Ensure that work surfaces are standard heights and that they are supported by adjustable legs.
2. *Aisle allowances.* Aisle space between equipment (see Figure III-2) should be sufficient to allow the safe movement of carts and personnel without infringement on work areas. The spaces between major pieces of equipment should allow for employees to use the equipment easily.

   The width of single aisles should be from 36 to 42 inches (91 to 107 centimetres). The standard width is 42 inches (107 centimetres). Major traffic aisles should be from 4 to 6 feet (1.2 to 1.8 metres) in width. The space between major pieces of equipment should be from 3 1/2 to 4 feet (1.1 to 1.2 metres).
3. *Serving and dining areas.* The space allotted for serving will depend on the type of service to be

**TABLE III-3**
**Sample Allocation of Square Feet (Square Metres) Needed in a Production Kitchen and Dining Area**

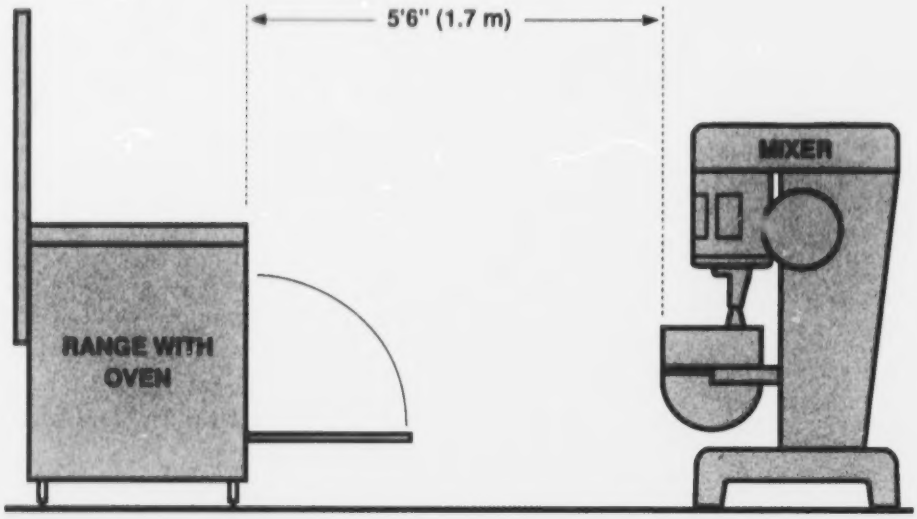
| Area | School level and enrollment | | | | | |
|---|---|---|---|---|---|---|
| | Elementary 600 enrollment | | Junior high 800 enrollment | | High 1,800 enrollment | |
| Receiving | 60 | (5.6) | 60 | (5.6) | 100 | (9.3) |
| Food preparation (including refrigeration/dish washing) | 1,000 | (92.9) | 1,200 | (111.5) | 1,440–1,550 | (133.8–144.0) |
| Serving line[a] | 250–500 | (23.2–46.5) | 400–750 | (37.2–69.7) | 1,150–1,700 | (106.8–157.9) |
| Dry storage[b] | 300 | (27.6) | 500 | (46) | 700 | (64.4) |
| Office | 60 | (5.6) | 60 | (5.6) | 80 | (7.4) |
| Employees' toilet/employees' facility | 150 | (13.8) | 200 | (18.4) | 300 | (27.6) |
| Trash and garbage | 100 | (9.2) | 150 | (13.8) | 200 | (18.4) |
| Student and faculty seating[c] | 2,000 | (185.8) | 2,970 | (275.9) | 9,900–10,800 | (919.7–1003.3) |
| **Totals** | 3,920–4,170 | (364.2–387.4) | 5,540–5,890 | (514.6–547.1) | 13,870–15,430 | (1288.5–1433.4) |

[a]Elementary school with one or two lines; junior high school with two lines and optional snack bar; high school with three or four lines and snack bar.

[b]Includes a separate area for storage of detergents and cleaning agents. If single-use disposable dishes and eating utensils are to be used, additional nonfood storage space will be needed and less space will be needed in the food preparation area.

[c]Elementary school and junior high school, three meal periods; high school, two meal periods. Space for faculty dining would be included in this allocation.

Adequate aisle space between two pieces of protruding equipment




Moving the mixer (above) or changing the orientation of the mixer could significantly reduce the necessary aisle space. Placing a table across from the oven (below) could reduce the necessary aisle

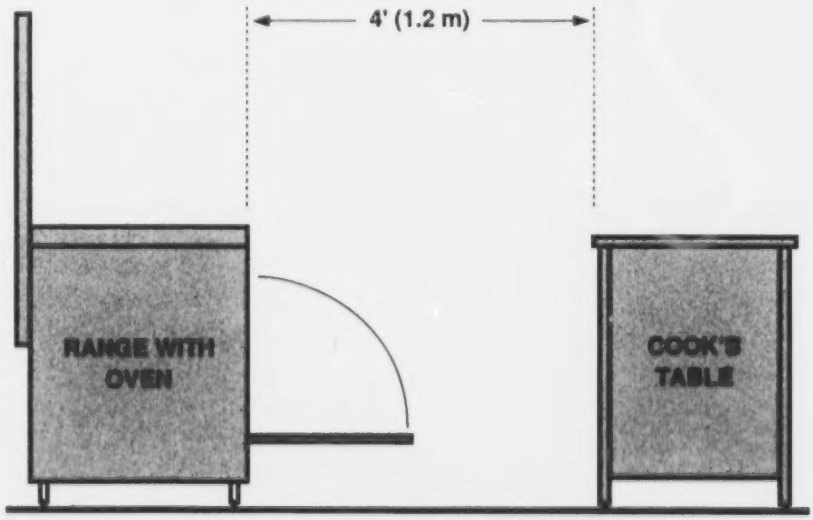



**Figure III-2**
**Efficient use of aisle space**

*Source:* Adapted from John C. Birchfield, *Design and Layout of Foodservice Facilities*. New York: Van Nostrand Reinhold, 1988, p. 47.

provided, the type of serving line, and the number of serving areas (see Table III-3).

The space recommended for the dining area is 8 to 14 square feet (0.7 to 1.3 square metres) per student (see Table III-4). Guides for allotting students' space requirements should be used cautiously. The square footage of a dining area will depend on such variables as (1) the configuration of the dining space; (2) obstructions, such as support columns and piping; (3) the types of tables and seats to be used; (4) the aisles (space) between tables and walls; (5) the ages and sizes of students; and (6) the requirements of the local fire codes. Because the space required is affected by the types of tables and/or booths to be used, the space guide in Table III-4 is based on the sizes of the most commonly used tables and chairs.

**TABLE III-4**

**Space Guide in Square Feet (Square Metres) per Student for Eating Areas**

| | *Rectangular tables* | | *Square or round tables with stacking chairs* |
|---|---|---|---|
| *Grade level* | *Folding with seats attached* | *Nonfolding with stacking chairs* | |
| Elementary K–6 | 8–10 (0.7–0.9) | 11–12 (1.0–1.1) | 11–14 (1.0–1.3) |
| Junior high 7–8 | 9–11 (0.8–0.9) | 11–14 (1.0–1.3) | 11–14 (1.0–1.3) |
| High 9–12 | 11 (1.0) | 11–14 (1.0–1.3) | 11–14 (1.0–1.3) |

*Source:* Adapted from *Equipment Guide for On-Site School Kitchens.* Washington, D.C.: U.S. Department of Agriculture, 1977.

*NOTE:* Tables are standard sizes and shapes. Check local fire codes for capacity loads.

Serving arrangements and dining facilities must be able to accommodate students who have disabling conditions. At least one aisle must be a minimum of 42 inches (107 centimetres) wide. Dining space should also be sufficient to seat such students who bring their lunches. To estimate such seating, divide the school's total enrollment capacity by the number of lunch periods. For example:

- School's total capacity (students): 1,800
- Number of lunch periods: 2
- Recommended square feet (square metres) per student: 8–14 (0.7–1.3)

For a high school with a capacity of 1,800 students, 11–14 square feet (1.0–1.3 square metres) of space per student, or a total of 9,900–12,600 square feet (919.7–1170.5 square metres) is recommended. The number of lunch periods is an important factor in this planning, but unfortunately the lunch schedule may not be known when planners are determining the size of the eating area.

If outside dining is to be used, consideration must be given to accommodating students during bad weather.

## D. Materials to Be Used

1. *Walls and ceilings in kitchen and dining areas.* The walls and ceilings in the kitchen and dining areas should have durable, smooth, nonabsorbent, washable surfaces that are easy to clean.

   If high quality is a priority, glazed ceramic tile or glazed structural blocks are the materials of choice for the walls in the kitchen and related areas. These materials are durable, long-lasting, and easy to clean and are particularly desirable for the dish-washing, cooking, and rest room areas. They are very expensive, but their upkeep costs are low.

   Hard plaster, masonry walls that are painted with several coats of epoxy paint and that are washable are acceptable and economical for use in the kitchen (cooking and dish-washing) areas. Although such walls cost much less to construct, their upkeep may be fairly costly. Maintenance costs can be reduced by using ceramic tile on the walls to a height of 6 feet (1.8 metres) and by finishing the rest of the walls with hard plaster.

   Fiberglass reinforced panels may be used and will be less expensive than tile or hard plaster panels that are painted. The panels are available in 10-foot (3-metre) lengths, and are either 4 feet (1.2 metres) or 8 feet (2.4 metres) wide. These panels are easily cleaned.

   Concrete block or drywall construction covered with epoxy paint is acceptable for receiving, storage, and service areas. However, epoxy paint on concrete blocks is not acceptable under the California Uniform Retail Food Facilities Law (CURFFL) unless the finish applied to the blocks results in a smooth surface without open pores or voids.

Painted drywall construction is recommended for offices.

Ceilings of kitchens and dining areas should be a minimum of 9 feet (2.7 metres) high (9 feet 6 inches [2.9 metres] is the standard height). Ceilings lower than 9 feet (2.7 metres) may cause problems with the air circulation over refrigerated units, and the hoods of these units may have to be recessed. There must be no exposed construction or pipes in ceilings. The acoustical finish of ceilings in kitchen areas should be nonabsorbent, nonporous, rodent-proof, fire resistant, and cleanable.

For top-quality ceilings, acoustical tiles are recommended. They must be resistant to moisture and grease. Lay-in tiles that measure 2 feet by 2 feet (0.6 metre by 0.6 metre) or 2 feet by 4 feet (0.6 metre by 1.2 metres) and that are supported by a conventional T-bar frame are recommended. Tiles with fissures or voids are not acceptable. Nonporous tiles (holes do not go all the way through the tiles) are required.

Aluminum or other metals that are easy to clean are acceptable as lower cost alternatives to acoustical tile. The metal panels should be of a size that allows them to be put through a dishwasher. Plaster ceilings may also be used, but they must be waterproof and mildew-resistant. Fiberglass reinforced panels may also be used as a lay-in tile for T-bar frames.

2. *Flooring in kitchen areas.* A slip-resistant, grease-proof surface with a continuous cove base is recommended in kitchen areas. In a central kitchen, the flooring should be strong enough to bear the weight of loaded pallets.

CURFFL Section 27631 requires that floors be smooth, of durable construction, and nonabsorbent. No law or regulation indicates the types of materials required; this decision is left to the judgment of local health departments. Materials that are acceptable in one school district may not be acceptable in another.

For top-quality flooring in all locations, quarry or ceramic tile or terrazzo is recommended. These materials are durable, grease-resistant, nonabsorbent, and nonporous. These materials lack resiliency, however, and some may be slippery. Colored grout is recommended for use with tiles; black epoxy grout is resistant to food acids, and it never stains.

An acceptable and more economical alternative to all-tile floors is combination flooring. In this choice, quarry tile is used around areas where a durable surface is required that will not buckle when water stands on it (such as around kettles, steamers, vertical cutter-mixers, sinks, and dish-washing machines); in other areas, a more resilient flooring may be used. This flooring can be slip-resistant, seamless vinyl (or, if not seamless, seams must be welded) or grease-proof tile. Vinyl is less durable than quarry tile, ceramic tile, or terrazzo, and it has grease-absorbing qualities. If vinyl flooring is to be used, it must be 100 percent free of asbestos and the specifications of the kitchen equipment to be used should call for legs that will not cut through the vinyl. Concrete with a troweled finish may be acceptable for storerooms and warehouses.

## E. Lighting

In accordance with CURFFL Section 27635 (see Appendix A), the area in which food is prepared, processed, or packaged, or in which utensils are cleaned, must be provided with lighting sufficient to produce an intensity of not less than 20 footcandles (215 lux) as measured 30 inches (76 centimetres) above the floor. Storage and toilet areas must be provided with at least 10 footcandles (108 lux) measured 30 inches (76 centimetres) above the floor. More than minimal lighting is desirable, however. A guide for recommended footcandle levels is shown in Table III-5.

Lighting equipment in kitchens should include:

1. Fixtures or bulbs that are mounted flush or tight with the ceiling, completely covered, and removable for ease in cleaning
2. Vapor lights enclosed in metal cages and protected on all sides for use in exhaust hoods and walk-in refrigeration units
3. Easily accessible light switches to encourage workers to turn off lights in areas that are not being used
4. Emergency lighting, particularly in areas without windows
5. Safety covers for all lights in kitchens and those in food storage, dish-washing, and serving areas (in accordance with local health codes)

Pink lighting in serving areas will make food look more appetizing. White fluorescent lamps provide the best true color perception. Lighting in the

dining area should be from clustered incandescent or similar-type bulbs.

**TABLE III-5**
**Recommended Footcandle Levels in Food Service Areas**

| *Area* | *Footcandles* |
|---|---|
| Cashier's | 50–75 |
| Food display | 50–75 |
| Cleaning/dish washing | 50–75 |
| Storeroom | 20–35 |
| Preparation/cooking | 50–75 |
| Dining room | 40–50 |
| Office | 80–100 |

## F. Sound Levels

Sound-absorbent materials and other acoustical considerations should be part of the designs for multipurpose and kitchen areas. Typically, hard floors and the walls and ceilings in dining and kitchen areas require sound-absorbent materials and/or acoustical tiles. Sound levels in dining areas can be lowered at nominal cost by adding draperies or decorative blocks of absorbent cloth (stretched as canvas on frames) to walls. Remote locations for compressors will help reduce sound levels in kitchen areas.

If some sound reduction measures are not taken, sound levels in dining areas can approach the danger level (above 90 decibels) when these areas are filled with students. CAL/OSHA considers 90 decibels for 8 hours sufficient to cause permanent loss of hearing. The Environmental Protection Agency designates 85 decibels as the danger level. The satisfactory level is 40 to 70 decibels.

## G. Cooking Fuels

The decision whether to use gas or electricity in the food service facility will probably be based on the energy needs of the school as a whole and on rates and services available in the area. These factors should be carefully considered when choosing between electricity or gas.

Electricity provides 100 percent usable heat. Electric cooking is efficient, cool, and clean and can be accurately controlled. It may be considered slow to reach desired temperatures, however.

Gas is only 60 percent usable, but its costs may still be less than those of electricity. Gas also adds heat to the kitchen, and this factor should be considered if climate control does not extend to the kitchen. Automatic ignitions can reduce the amount of heat added. Gas equipment is quicker to reach desired temperatures, and cooks often prefer it for this reason. Also, quick-disconnect couplings make gas appliances more flexible and mobile.

It is important that the gas and electrical systems' capacities be adequate for peak demands.

## H. Sources of Steam for Steam Equipment

Steam equipment can be specified as *self-contained* or *direct steam*. With self-contained equipment a steam generator is an integral part of the unit. This type is most frequently used in kitchens today. Some of the smaller steamers, such as the convection steamer, have water reservoirs with electric elements that heat the water to steam and allow food to be cooked directly with steam that is not under pressure.

If a new or renovated facility does not include dish-washing equipment or several pieces of steam-operated equipment for which a boiler provides the source of steam, self-contained equipment is recommended. Equipment that requires direct steam needs a separate source of steam in order to operate.

According to the U.S. Department of Agriculture's *Equipment Guide for On-Site School Kitchens*, if a facility includes dish-washing equipment and/or several pieces of steam-operated equipment, consideration should be given to the purchase of direct-steam–operated equipment and a steam generator. The advantages of such a system are:

1. Ease of operation
2. Simultaneous operation of all steam-operated equipment at full capacity if the system is properly sized
3. Instantaneous heat-up and shorter cooking times
4. Greater efficiency, resulting in lower operating costs
5. Low maintenance costs
6. Greater life expectancy
7. Lower initial costs for equipment and installation if equipment is used in a large kitchen
8. Steam available for cleaning, heating water, and other uses

Other sources of uncontaminated steam, or clean steam, may be available elsewhere in the school facility and may provide direct steam to the kitchen. However, if a source outside the kitchen is used, it is essential that the steam be available at all times during which the kitchen is in use. Higher steam pressure can reduce cooking time.

When the boiler requirement exceeds 15 pounds (6.8 kilograms) of steam pressure and more than 9 boiler horsepower (6.7 kilowatts), an appropriately certified boiler mechanic must be on duty 24 hours a day or at all times during which the boiler is in operation (in accordance with the *California Code of Regulations, Title 8, Industrial Relations,* "Unfired Pressure Vessel Safety Orders," and the Class 4 Code of the American Society of Mechanical Engineers [ASME]). Having a mechanic on site 24 hours per day can be very costly. If two or three smaller boilers are used to provide the pressure needed, the expense of a full-time boiler mechanic can be avoided.

The larger boiler systems are usually remote direct-steam assemblies that supply steam to equipment of large capacity, such as a series of 150- to 200-gallon (568- to 757-litre) kettles of a type used in a food service production center. A remote steam plant that supplies steam directly to the various pieces of kitchen equipment should be located out of the kitchen area in a special room or enclosure to protect personnel from injury.

## I. Heating, Ventilation, Air Circulation, and Cooling

Climate control should extend throughout the dining and kitchen areas, and the controls for these areas should be separate from those of the master control system. Air-conditioning usually does not extend to the kitchen, but given the heat generated by the cooking equipment, there is a definite need for air-conditioning in the kitchen. The master exhaust and ventilation system cannot cool a hot kitchen.

Employees' maximum productivity and maximum energy efficiency are achieved when the work environment's temperature is maintained at around 68 degrees Fahrenheit (20 degrees Celsius) during winter months, when the relative humidity is higher, and around 78 degrees Fahrenheit (25.1 degrees Celsius) during the summer months, when the relative humidity is lower.

Exterior windows may or may not be sources of ventilation. Engineers do not recommend the use of windows that open, because balanced air circulation is based on windows being closed. Windows require cleaning and, thus, increase labor costs. On the positive side, when electrical blackouts occur, windows provide light.

In colder climates if the door or doors leading to the outside must be left open for periods of time, the kitchen may become very cold. For this reason, an inside door separating the corridor or receiving area from the outside door may be desirable.

"Swamp air" is a slang term used in the mechanical and food service industries to describe air supplied by an evaporative cooler that does not refrigerate the air. Swamp coolers have reservoir pans of water and pumps that distribute water up and over fiber screens that are cooled by the water and that in turn cool the air coming into the kitchen. This type of "makeup air" cooler is typically used in areas where the outside summer air is hot and dry. Swamp coolers are often preferred because they use less energy. Wetter air cools best in a dry climate. With such coolers, however, heaters might be necessary to temper air during the winter when the reservoir pumps are turned off.

Mechanical air-conditioning can be used in certain areas to provide makeup air, but the energy costs for this type of cooling are quite high and the system must be engineered carefully to minimize the waste of energy.

Kitchen air should be changed from 12 to 20 times per hour; storeroom air should be changed four or five times per hour. Intake air must be balanced with exhaust air.

A ventilation system is required when the preparation of food produces heat, odor, smoke, steam, or grease-laden vapor. The basic components of a ventilation system include a ventilator, ducts, air movement equipment, and other special accessories (e.g., fan duct and fire protection equipment). The National Fire Protection Association's (NFPA) Bulletin 96 sets forth guidelines for a ventilation system, and they should be followed.

If grills, deep-fat fryers, and top-of-stove cooking methods are used, the kitchen's ventilation system must be interconnected with the fire-suppression equipment.

1. *Styles of ventilators.* The canopy, or hood, ventilator is designed to remove air, grease, odors, and water vapors. The primary hood (number 1 hood), which is mounted over the cooking equipment,

normally overhangs the battery of cooking equipment by a minimum of 6 inches (15.2 centimetres) on all exposed sides. Some local codes require overhangs of 12 inches (30.5 centimetres) (local codes should be checked). Hoods should be mounted no higher than 7 feet (2.1 metres) from the floor to their lower edges. The types of canopies, or hoods, are island, wall, corner, and slot.

Vapor hoods can be used in dish-washing areas, over steam equipment, or over nonsurface cooking equipment. One advantage of a vapor hood is that it does not require a fire-suppression system, rated fire shaft, or welded duct to the outside.

A secondary hood (number 2 hood) is generally a condensation hood and will be needed over high-temperature dish-washing machines and over all cooking equipment that exceeds 250 degrees Fahrenheit (121 degrees Celsius). For applications of secondary hoods, it is important that the architects and engineers design a heating, ventilating, and air-conditioning (HVAC) system that supplies a volume of intake and exhaust air sufficient to keep the moisture level as low as possible.

The flow of air in the hood system is measured in cubic feet per minute (cfm). This flow of air is produced by a combination of supply (makeup) air and air from fans. The supply air can come from the dining room, from ducts installed in the walls of the kitchen, or from ducts built into the hood system. When insufficient makeup air is provided, a negative pressure (vacuum) will result. This vacuum will draw the needed air from other parts of the building.

Filters or extractors located in the primary hood filter the air coming through the system. The centrifugal extractor canopy-style ventilator generally does not require an overhang. Incandescent or fluorescent vapor-proof lights (in metal cages) should be located in the hood. The hood must meet CAL/OSHA standards. Figure III-3 provides sample specifications for an exhaust hood that is equipped with a fire-suppression system.

The back shelf, or under shelf, ventilator is a proximity ventilator that sits beside or projects forward from the rear side of the cooking equipment. It is generally the length of the equipment and is used primarily in snack bar areas where cooking is limited. It catches the air and steam

**Sample Specifications**

a. Rigid welded steel angle frames and 18-gauge stainless steel are to be used on the interior and exterior, including all horizontal stainless steel center panels and column fillers. (The facility's plan will usually provide an outline showing the unit's size and shape, which would be referred to here.)

b. Connecting duct work above the ceiling is to be installed by the mechanical contractor to the connection collars of the galvanized exhaust plenums and the galvanized supply-air plenums built into hoods. The final connection to the ducts is to be made in an approved manner by the HVAC contractor.

c. Grease-proof standing seams are to be used on all joints that are not welded.

d. Eighteen-gauge stainless steel filter racks with NFPA-approved removable stainless steel filter cells with loop handles and retaining clips are to be used.

e. Vapor-proof lights with bulbs in metal cages are to be installed and prewired to a final connection point (junction box) on top of the hood. The electrician is to furnish a wall-mounted switch and connect any exterior field wiring that is required. (The plan of electrical requirements will show the quantity of lights that are required.) The center portion of the hood is to have stainless steel flush vapor-proof fixtures in accordance with the electrical plan.

f. Half-inch-diameter (1.3-centimetre-diameter) steel hanger rods at 48 inches (122 centimetres) on center (o.c.) maximum are to be used. These rods are to be anchored to the supporting structure (or slab) by the general contractor in the locations required by the shop detail drawings of the exhaust hood.

g. A dry chemical hood that contains a fire extinguishing system and that is approved by Underwriters' Laboratories should be provided. The hood's system cylinder and hardware should come with a one-year warranty. Nozzles may be required for surface protection of equipment. The entire system is to comply with the provisions of NFPA Bulletin 96 and local fire codes. All exposed fire-control piping is to be chrome plated.

h. Stainless steel cabinets for fire-control cylinders are to be constructed in accordance with shop detail drawings.

**Figure III-3**

**Sample specifications for an exhaust hood with a fire-suppression system**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close to the point of origin at a rate of 1,450 cubic feet (41cubic metres) per minute. This style of ventilator may cost as much as or more than the canopy type to purchase, but it will be more efficient. It will reduce the volume of air taken from the room and the volume of air that is needed for cooling. Backshelf extractors may not be suitable for equipment in the kitchen, because they do not meet fire codes for some large equipment.

The two types of ventilators, canopy and back shelf, are shown in Figure III-4.

The venting of exhaust air directly outside is an option for some equipment. Local codes should be checked.

2. *Types of filters.* The metal mesh filter was the most common filter used for many years; however, in recent years it has been outlawed in California and in many other states. Mesh filters can probably be found in many older schools. Baffle filters are often used today.

   The centrifugal extractor removes grease and other suspended particles by centrifugal force; high-velocity air is forced to make rapid turns within the unit. Self-cleaning features may be specified when ordering this extractor.

   NFPA Bulletin 96 sets standards for ventilation, vapor removal, and fire-extinguishing systems. Its installation standards are generally accepted throughout the United States; however, local building codes should be consulted.

## J. Fire-Protection System

Dining rooms and kitchens must be protected by fire-control systems that meet the NFPA's standards. Kitchen fire-suppression systems are addressed in NFPA bulletins 17A, 19, and 96; copies of these bulletins can be obtained from local offices of the NFPA.

The fire-suppression system can be either "wet" or "dry." Most frequently used is the wet chemical system, which employs a potassium carbonate–based liquid. Of the two systems, the residue of the wet system is the easiest for personnel to clean up after a fire. Use of this liquid-based suppressant may allow for food production to continue in areas that were unaffected by the fire.

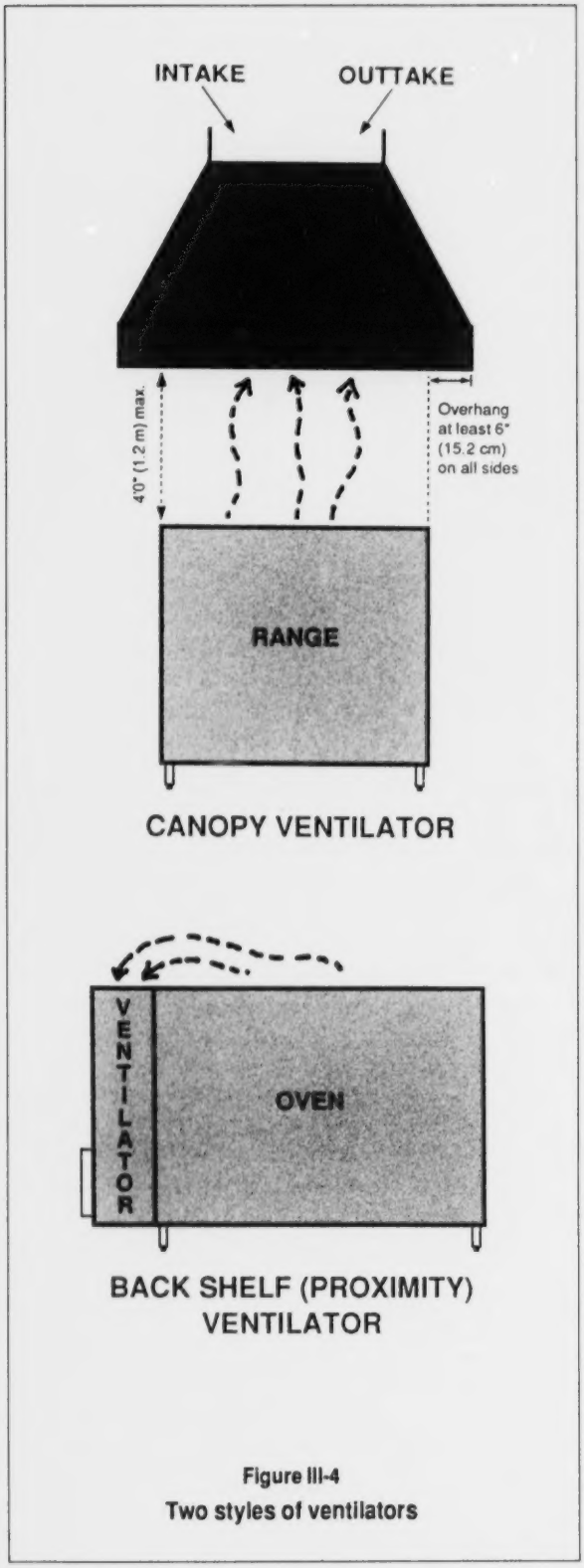


**Figure III-4**
**Two styles of ventilators**

The NFPA develops standards, not codes, but these standards are often adopted locally as codes. The authority having jurisdiction will inspect the system's installation for compliance with the existing local codes. The inspection is usually performed by the local fire chief or fire marshal. However, the "authority having jurisdiction" may be another agency. Fire codes may differ slightly from city to city depending on the approval agencies. Local governmental jurisdictions should be contacted to verify fire code requirements.

## K. Water Temperature, Pressure, and Quantity

Hot and cold water connections will be needed in the can-washing area if can liners are not used and in areas where steam equipment and vertical cutter-mixers, dish-washing machines, hand sinks, and kitchen sinks are located. Cool water for drinking will be needed at water fountains and for ice-making machines. The quantities of hot water needed should be thoroughly calculated to meet needs at peak times. The water pressure and the time required to fill a sink or large kettle should be calculated. The child nutrition director and the food service facility's consultant should determine the volume of water that is required during peak periods.

## L. Plumbing

Properly sized pipes, tight-fitting joints, and adequate venting are essential to a kitchen. Pipe size will depend on water volume needs. All drains and sewage lines should have traps installed to prevent the backup of sewer gas and the passage of vermin. The traps should be accessible for ease in cleaning. Back-flow prevention devices may be required in water lines that connect to pot-filling faucets, braising skillets, steamers, and so forth. The health department or a local plumbing contractor should be consulted if these units are to be used.

Sewer gas is usually vented through waste stacks that extend through the roof. The *National Plumbing Code* provides a standard for venting; however, the local health department's codes should be consulted for local requirements.

Floor troughs should be provided for vertical cutter-mixers, steam-jacketed kettles, and steam cookers. Floor drains should be provided to facilitate the cleaning of floors in pot-washing and dish-washing areas. Drains should not be located in the traffic aisles. If drains are placed under equipment, the pitch of a floor leading to a drain should not interfere with the leveling of the equipment's legs. Drainage problems occur when drains are located too close to the equipment or too far from the drain flow or when the drain is too small to handle the flow of liquid. Evaporators that require drainage are usually provided for reach-in refrigeration units. Walk-in refrigerators require a floor sink to be drained. The evaporator coil in walk-in refrigerators and freezers requires a drain pipe that must be drained to an air-gap–type drain or to a floor sink outside the refrigerator box.

## M. Electricity

The electrical panel for a kitchen should be planned with growth in mind. The kitchen's panel should be separate from panels for other parts of the school. See Section V for a discussion of convenience outlets.

Care should be taken in calculating a kitchen's electrical needs to ensure that all equipment can operate simultaneously. The condenser of a walk-in refrigerator or freezer will draw a lot of current when it comes on after a power outage. Equipment that uses computer chips—vending machines, cash registers, computers, and so on—should have dedicated lines to protect against surges of electricity. The electrical needs of the various pieces of equipment should be considered.

Ice cream cabinets, refrigerated vending machines, and milk coolers that are located on serving lines or in open areas may need a lock plug, which will prevent undesirable disconnections.

S E C T I O N

# The Receiving and Storage Areas

## A. Receiving

The following factors should be taken into account when planning outside and inside receiving areas:

1. *Loading and unloading areas.* Most on-site kitchens do not need a raised loading dock; a loading and unloading area at grade level may be sufficient and more cost-effective.

A loading platform, or dock, may be desirable at central kitchens and is recommended for food service production centers and warehouses for ease in receiving deliveries and in loading. The following features should be considered when planning a loading dock:

a. A location adjacent to the food preparation area
b. Poured concrete steps if the dock is to be a raised platform
c. A roof over the platform that is higher than the roof of the tallest truck that will unload there (approximately 12 feet 6 inches [3.8 metres] above ground level)
d. An outside bell for entry when the back door is locked
e. A turning area and easy access for large trucks

The length of the dock should be based on the number of delivery trucks that are likely to unload at one time (10 to 15 feet [3.1 to 4.6 metres] per truck).

The dock should have a floor of hardened concrete that has a bumper edge if the platform is to be raised. The floor's surface should be slip-resistant, sloped to drain, and at the same level as the kitchen floor. Floors should be strong enough to bear the weight of forklifts and pallet jacks.

The platform should be a minimum of 6 feet (1.8 metres) deep from front to back. An 8-foot (2.4-metre) depth is preferred. If raised, the platform should be from 3 to 3 1/2 feet (0.9 to 1.1 metres) in height.

Doors leading inside from the platform should be a minimum of 42 inches (1.1 metres) wide and 8 feet (2.4 metres) high. A 48-inch (1.2-metre) width that will accommodate the passage of forklifts and pallet jacks is recommended. These doors should be self-closing, securable with locking devices, and of heavy-duty manufacture. Kick plates should be mounted on each side of each door.

An antipest fan should be mounted on the outside over the door.[1] An outside light should be installed. Windows in doors, if used, should be 12 inches by 14 inches (30.5 centimetres by 35.6 centimetres). Roll-up doors may be used.

2. *Inside receiving area.* The inside receiving area should be adjacent to the loading dock and near or inside the kitchen and storage areas. This area should have a desk or stand-up table 42 inches (1.1 metres) high to accommodate a calculator and the writing of orders. The area should include a portable, digital, or beam-type scale with a minimum capacity of 400 pounds (181 kilograms) in 1/4- to 1/2-pound (0.1- to 0.2-kilogram) graduations.

The space required for the inside receiving area should be determined in accordance with the number of customers to be served per meal (see Table IV-1):

[1] The California State Department of Health Services requires pest control fans to turn at 1,800 rpm at least 3 feet (91.4 centimetres) above the floor.

**TABLE IV-1**

**Required Inside Receiving Space Determined by Number of Customers Served per Meal**

| *Customers served* | *Space required* |
|---|---|
| 300 | 40 square feet (3.7 square metres) |
| 500 | 60 square feet (5.5 square metres) |
| 1,000 | 80–90 square feet (7.4–8.2 square metres) |
| 2,000 | 100–150 square feet (9.2–13.8 square metres) |
| 5,000 | 150–200 square feet (13.8–18.4 square metres) |
| Over 5,000 | 175–250 square feet (16.1–23 square metres) |

## B. Storage

Factors to be considered in planning storage space in kitchen areas include the following:

- The quantity of inventory to be stored
- The frequency of deliveries
- Whether USDA-donated foods are to be stored at the facility (space required for an 8- to 10-weeks' supply of USDA commodities)
- The form in which food is to be received; e.g., raw ingredients or partially or completely processed foods
- The type of processing that is planned for canned, aseptic (shelf-stable), dried, frozen, or fresh foods (see Table II-2)
- The need for separation of cleaning supplies and other dangerous chemicals from foodstuffs
- The possible need for additional storage for disaster preparedness

1. *Determining storage requirements.* The first decision to be made is what will be stored in the space allotted for storage and in what size and type containers. Will food be stored on pallets? In cases on a shelf? See Section III for additional information on storage space.

   Approximately 1 cubic foot (0.03 cubic metre) is required to store a case (30 to 35 pounds; 13.6 to 15.9 kilograms) of food, and 4 cubic feet (0.11 cubic metres) is needed to store a pallet. The configuration or size of a storage area should be based on the shelving and dunnage needed and whether mobile carts and racks will be stored in the area. Traditionally, shelving has been secured to the walls and floors, but some planners prefer mobile shelving. The cost of the shelving may or may not be a part of the building's contract.

   A high-density storage system on tracks should be considered if square footage is limited. The initial cost of a high-density system may be higher, depending on the construction cost per square foot. The advantages of this system are more storage in less space, improved security, and the option of using computerized and automated equipment.

2. *Storage of dry food.* The space used for storage should be part of the total space allotted for the kitchen.

   Factors and equipment to consider when planning the dry-food storage areas include:

   a. A location that is adjacent to the kitchen and the receiving area
   b. Flooring and walls as discussed in Section III
   c. An easy-to-read, reliable wall thermometer that is mounted at eye level and away from airflows
   d. Insulated exterior walls
   e. Insulated pipes and water heaters
   f. Portable dunnage racks with clearances of 6 inches (15.2 centimetres)
   g. Mobile bins for the storage of bulk items; e.g., dry beans, sugar, and flour
   h. The standardized sizes of California USDA food pallets:
      - Regular pallet: 40 x 48 inches (1 x 1.2 metres)
      - Slip sheet: 40 x 52 inches (1 x 1.3 metres)
   i. Hand-operated fire extinguishers
   j. Good lighting with no dark spots (see Table III-5 for a guide to footcandle levels)
   k. Measures to make storage areas vermin- and rodent-proof

   Storage areas should have standard door openings of 42 inches (106.7 centimetres) in on-site production kitchens (wider for central kitchens). Doors should be solid and of heavy-duty manufacture. They should lock from the outside and should not be on the school's master key system.

   Storage areas should have good air circulation; four air changes per hour are recommended. Temperatures should be thermostatically controlled at

70 degrees Fahrenheit (21.1 degrees Celsius) or below (but not freezing). Relative humidity of 50 percent should be maintained. USDA requirements for the storage of dry food—enforced in recent years—call for temperatures of 50 degrees Fahrenheit (10 degrees Celsius) to 70 degrees Fahrenheit (21.1 degrees Celsius).

Shelves of heavy metal are preferred for storage areas and may be required by local health departments. Shelves should be adjustable and should come in 3-, 4-, and 5-foot (0.9-, 1.2-, and 1.5-metre) lengths with three or four tiers per section. They should be 18 to 24 inches (45.7 to 61 centimetres) deep. Bottom shelves should be a minimum of 6 inches (15.2 centimetres) from the floor as required by CURFFL. Local health departments should be consulted for the minimum requirements in the area. Top shelves should be no more than 6 feet (1.8 metres) above the floor. Stainless steel 302-16-gauge shelving is recommended but is expensive; plastic-coated or chrome shelving is acceptable. Shelves should be mobile and should have load capacities of 800 to 1,000 pounds (363.2 to 454 kilograms).[2]

The following space requirements are provided for planning purposes:

a. Two cases of six #10 cans: 18 to 19 inches (45.7 to 48.3 centimetres)
b. One case of four 1-gallon (3.8-litre) containers: 14 inches (35.6 centimetres)

Three storeroom arrangements are shown in Figure IV-1.

3. *Dry nonfood storage.* A space that is separate from food storage areas is required for the storage of detergents, cleaning supplies, and insecticides. Paper goods and other such supplies may also be stored in this area. The factors to consider when storing dry foods (see page 39) also apply to the storage of nonfood materials.

4. *Refrigerated storage.* Refrigerated storage includes both coolers (refrigerators) and freezers. Walk-in units should be considered if the quantity of food to be stored warrants more than 60 to 75 cubic feet (1.7 to 2.1 cubic metres) or if more than 250 meals per day are to be produced in the facility. The cost of two three-door refrigerators will be approximately as much as that of a walk-in unit. When space is not available inside the facility, a walk-in refrigerator can be located in a secure area outside the building with its door leading directly into the kitchen. The use of an outside unit does not affect square footage allotments under state funding regulations.

The locations of reach-in refrigerators and freezers should be specified in the layout of the kitchen because these units may require special wiring.

Specifications may include walk-in coolers and freezers, and energy-efficient freezers that open into the cooler may be purchased. However, in the interest of labor efficiency, it may be more desirable to have the cooler and freezer side by side. This is true particularly if a lot of frozen foods are to be used and if a lot of meals are to be served. The floors of walk-in units should be level with the kitchen's floor, which will have to be lowered about 3 to 5 inches (7.6 to 12.7 centimetres) in the space that will be under the freezer. Errors in leveling can be corrected with ramps inside the units. Some walk-in cooler (refrigerator) units can be placed directly on the floor without insulation. Others cannot—the freezer's floor will buckle and require replacement if the unit is not properly insulated and lowered. The manufacturer's recommendations should be followed in the installation of freezers. Energy savings may justify the insulation of both cooler and freezer units.

The following factors and/or features should be considered when purchasing a walk-in refrigerator and freezer:

a. A prefabricated unit is recommended over a customized built-in unit. Modular panels in 1-foot (30.5-centimetre) increments will allow for any size combination.
b. Panels that match the exterior should extend from the top of the unit to the ceiling; these panels are removable for easy access to the service connections at the top of the unit.
c. Skid-resistant flooring that is level with the kitchen's floor should be used.
d. The freezer unit's floor can be made of stainless steel with a 14-gauge galvanized finish, or it can be an aluminum plate. Flooring should be struc-

[2] Shelves on large lockable casters have many advantages. They are flexible and require less aisle space between shelf sections. Their mobility aids in cleaning, in taking inventory, and in receiving large shipments.

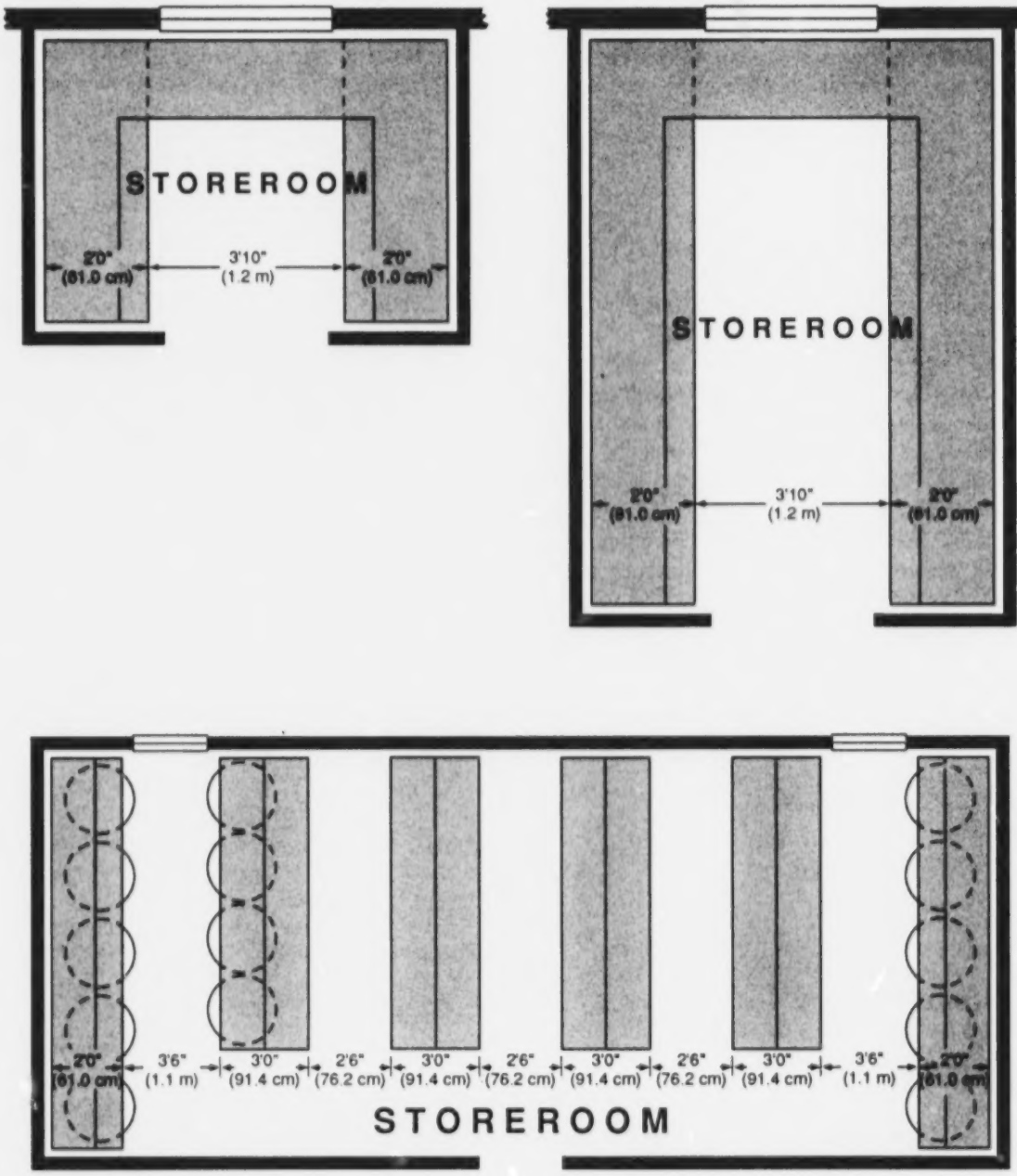


**Figure IV-1**
**Possible storeroom arrangements**

*Source: A Guide for Planning and Equipping School Lunchrooms.* Washington, D.C.: U.S. Department of Agriculture, 1956.

tured to withstand 600 pounds per square foot (272.4 kilograms per square metre).

e. The unit's interior should be well-lighted.

f. The unit should have a safety door that is easy to open from the inside.

g. A dial-type or digital thermometer should be mounted on the unit's exterior at a height of 6 feet (1.8 metres).

h. An audio or visual alarm system that warns of an unacceptably high temperature in the freezer should be installed. The alarm can be linked to a centralized security system.

i. Thermal strips may be mounted over door openings (optional); thermal strips are especially useful if doors are equipped with automatic closure mechanisms.

j. The door may swing outward, or a sliding door 36 to 48 inches (91.4 to 121.9 centimetres) wide may be used. A sliding door will be needed if pallets of food are to be stored in the unit.

k. The unit should have a timed or clock-controlled defrosting cycle.

l. Aisles should be wide enough between shelves to accommodate carts (see Figure IV-2 for a sample layout of a walk-in cooler).

m. Doors with pressure relief vents for easy opening should be installed in large freezer units.

n. Doors with glass view ports should be installed.

o. A condensate drain line is required on the outside of cooler units.

p. Vinyl exterior panels in various colors are available for exposed walls. These panels cost less and reflect less glare than stainless steel panels. Stucco-embossed aluminum panels are also available.

q. Outdoor cooler and freezer units are available that are made to withstand environmental conditions. These units can be positioned against the building, and a door should lead from the cooler or freezer directly into the kitchen.

Heavy-duty wire shelving—stainless steel is preferable—should be used in coolers and freezers. Vinyl-coated or zinc-coated shelving is acceptable.

Refrigerator units should have space for the storage of mobile carts that can be filled with food products.

A remotely located compressor can be used. A remote location for the compressor results in more space and less noise, dust, and heat in the kitchen. The compressor can be serviced more easily from outside the kitchen.

If the compressor is located on top of the cooling unit, the ceiling's height must meet the compressor's warranty and local code requirements.

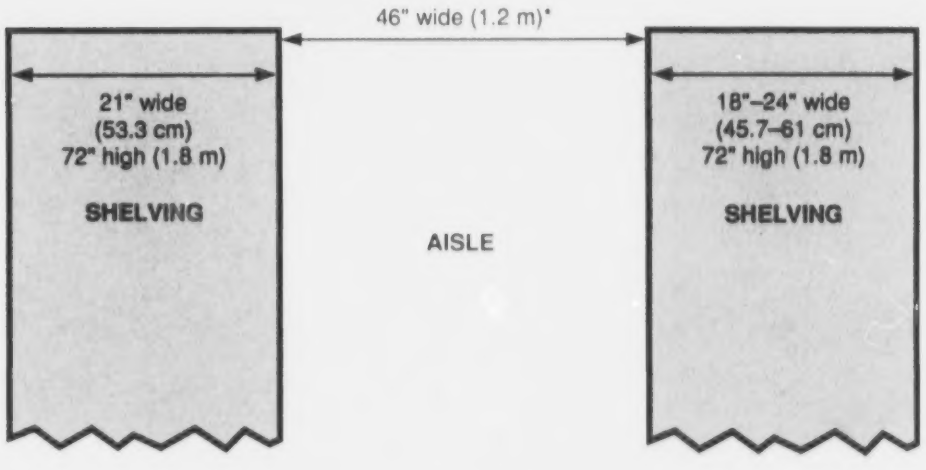


**Figure IV-2**
**Sample layout of aisles and shelves in a walk-in cooler**

*Width to accommodate carts and racks; width will need to be greater if pallets of food are to be stored.



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# SECTION V

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S E C T I O N

# Food Preparation Areas

Food preparation areas should be located adjacent to the receiving, storage, serving, and dining areas. They are usually divided into several workstations:

- Preparation station
- Salad/sandwich station
- Cook's station (meat, entrees, and vegetables)
- Baking station
- Central ingredients room
- Portioning and packaging station

## A. Placement of Convenience Outlets

The placement of electrical outlets is important to a kitchen's operational flexibility and should be carefully thought out. Will the outlets be in the floor or the ceiling for workstations that are not adjacent to a wall? Floor outlets can present obstructions and cause safety problems. Ceiling outlets also have drawbacks, such as being too high for employees to reach, looking unsightly, and posing a danger for employees. Convenience outlets should be available for electrical equipment such as can openers, slicers, and choppers.

## B. Arrangement of Equipment in Workstations

The facility's ventilation system is a major consideration when planning the arrangement of equipment in a kitchen. Whether to place the cooking equipment along a wall or in an island arrangement and the type of exhaust system to be used are decisions that depend on the facility's ventilation system (see Section III).

The placement of equipment within workstations should be determined by the planned direction of work, right-to-left or left-to-right, and by the need to keep the flow of food as direct as possible.

Generally, the number of work tables needed should not exceed the anticipated number of employees who will work in this area.

If a vertical cutter-mixer is specified, a water source and a drain must be provided at the site. This equipment may require three-phase wiring (5 horsepower, 3-phase [230/460/60/3] is typical).

A minimum of one hand sink with a towel dispenser, soap dispenser, and mirror should be located in the kitchen.

A wall clock should be visible from all workstations.

Sufficient aisle space should be provided to encourage the use of mobile equipment such as carts and racks (see Section III for recommended aisle allowances).

Fire codes must also be considered when planning workstations.

1. *Preparation station.* The vegetable sink should be located near the refrigerator where produce will be stored and near the point of delivery.

   The preparation station may be part of the salad/sandwich station in a small kitchen. Equipment at this station should include a two-compartment sink with hot and cold water, a garbage disposal machine, an ice machine (optional), a slicer, and a chopper. Work surfaces should be provided.

   Plumbing codes should be checked carefully. The indirect waste connection (which prevents sewage backups) is required in California.

2. *Salad/sandwich station.* Preparation of salads and sandwiches requires slicers, dicers, mixing equipment, assembly space, and refrigeration. If this

station is combined with the preparation station, the flow of work should be carefully considered.

In schools with speed lines (service on both sides of the line), salad and sandwich stations may be used as packaging stations.

3. *Cook's station (main preparation station).* The cook's table and cooking equipment should be located convenient to a refrigerator, the pot sink, and the serving line for hot food.

   Steam equipment needs proper drainage and should be located close to a swivel faucet that can supply hot and cold water. The floor around steam equipment may be depressed 2 to 3 inches (5.1 to 7.6 centimetres) and surrounded by a low curb, or a drain trough that is covered with a flush grating may be provided. A kettle caddy may be used to eliminate the need for a trough. If a trough is used, it must be carefully planned and placed to be effective. Problems occur when drains are mislocated and floor surfaces around work areas become wet and slippery (see Section III for information on steam sources and plumbing).

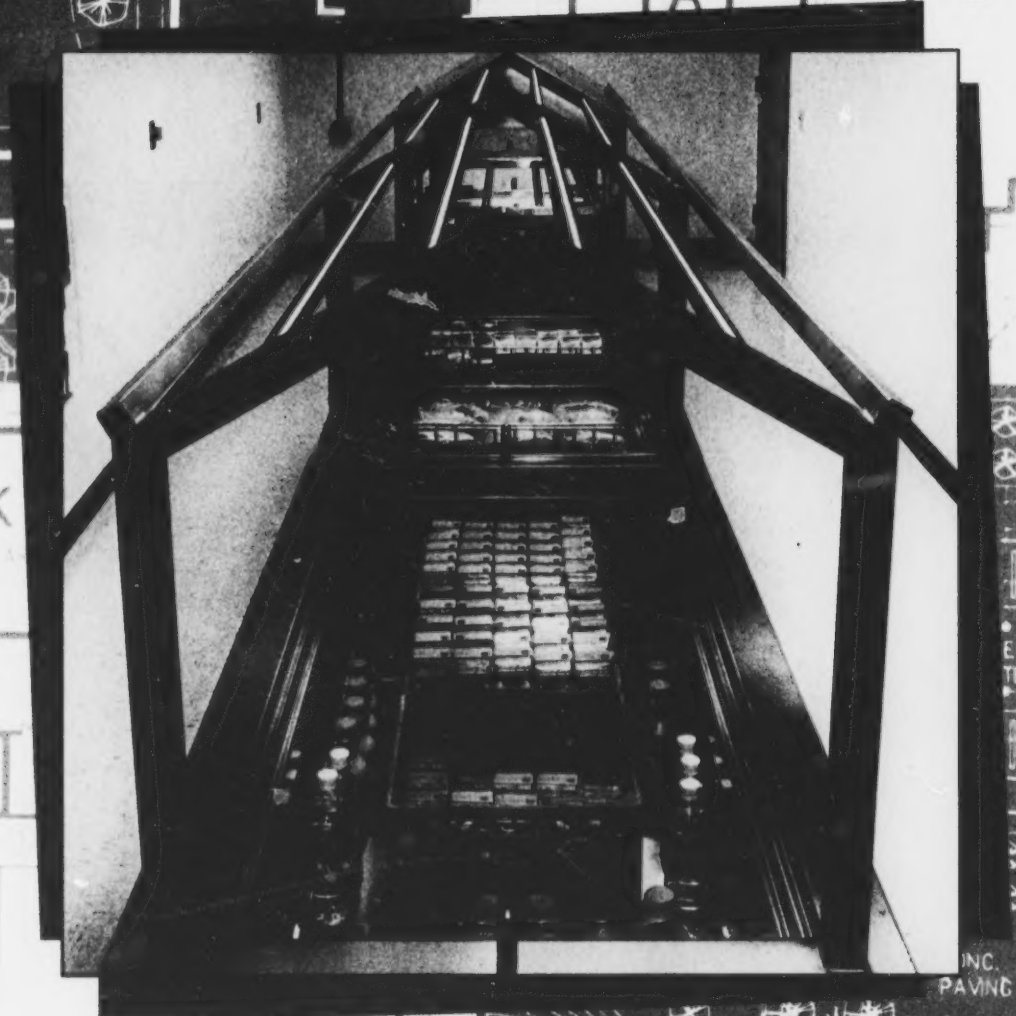
4. *Baking station.* The oven and the baker's table should be convenient to each other and to the pot sink and a refrigerator. If a table-size mixer is to be used on a portable stand, the stand should be equipped with locking casters. If only one mixer is provided and will be used by workers at more than one station, the mixer can be located between the two stations or at the station where it will be used the most.

   Bakers' tables generally have space for storage bins, which are available as separate units on wheels for ease in storage. Mixers, proofing cabinets, bakers' tables, and ovens are usually found at the baking station.

5. *Central ingredients room.* A central ingredients room may be practical for a large central kitchen and especially for a food production center (see also Section IX). This room should be adjacent to the storage areas and should have a table and counter space for scales for measuring and weighing ingredients. Aisle space in this room should be sufficient to permit carts to move in and out as needed.

6. *Portioning and packaging station.* The portioning and packaging station may be a separate station, or it may be part of one of the other stations. It should be convenient to the serving line and holding boxes. Small serving equipment, display trays, and the supply of dishes or disposable wares to be used on the serving line will be located at this station.

# SECTION VI





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SECTION

# Serving and Dining Areas

## A. Serving Areas

The space needed for serving and the arrangement of that space vary greatly with the types of services to be offered.

1. *Types of services.* Commonly used types of service include:
   a. Traditional cafeteria serving lines
   b. Scramble cafeteria arrangements (see Figure VI-1)
   c. Self-service bars
   d. Speed lines (see Figure VI-2)
   e. Conveyor belts
   f. T-lines or modified T-lines (see Figure VI-3)
   g. Carousel or revolving serving lines
   h. Serving windows or snack bar windows
   i. Counters from which orders are placed
   j. Mobile units taken to different locations
   k. Kiosks and/or multiple decentralized areas
   l. Vending machines

The space required for each of the above services will be determined by the equipment used for each. The lengths of some standard modular sections (see Table VI-1) that are commonly used in cafeteria serving lines may be helpful in determining the space needed:

**TABLE VI-1**
**Lengths of Sections in Serving Lines**

| *Section* | *Length* |
|---|---|
| Milk cooler | 3–6 ft. (0.9–1.8 m) |
| Flatware/napkin/tray | 2–3 ft. (0.6–0.9 m) |
| Hot foods section | 5–6 ft. (1.5–1.8 m) |
| Cold foods section | 5–6 ft. (1.5–1.8 m) |
| Cashier's section | 2 ft. (0.6 m) |

Serving equipment should enhance food by providing an attractive display and should maintain food in a safe condition. Hot food should be maintained at a temperature of 140 degrees Fahrenheit (60 degrees Celsius) or higher. Cold food should be kept below 40 degrees Fahrenheit (4.4 degrees Celsius).

Food on serving counters will need to be replenished, and the counter arrangement should, therefore, allow for easy access. The revolving carousel serving line, for example, is easy to replenish and can serve six to eight customers at the same time. However, breakdowns can almost put the line out of use.

Sneeze guards (plastic or glass plates) must be used to shield foods that are not wrapped or covered. Sneeze guards can be hung from the ceiling.

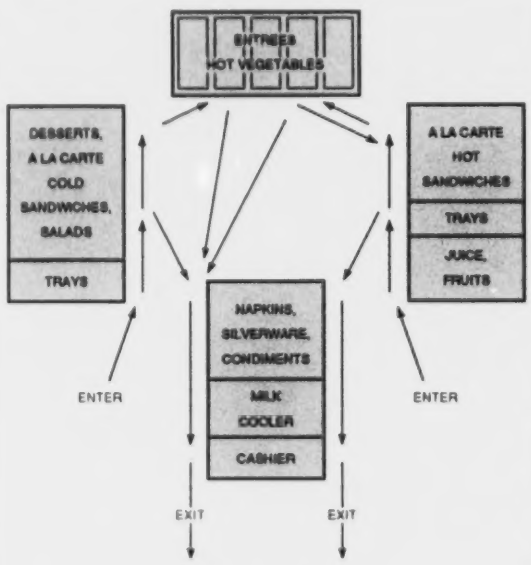


**Figure VI-1**
**Scramble serving line**

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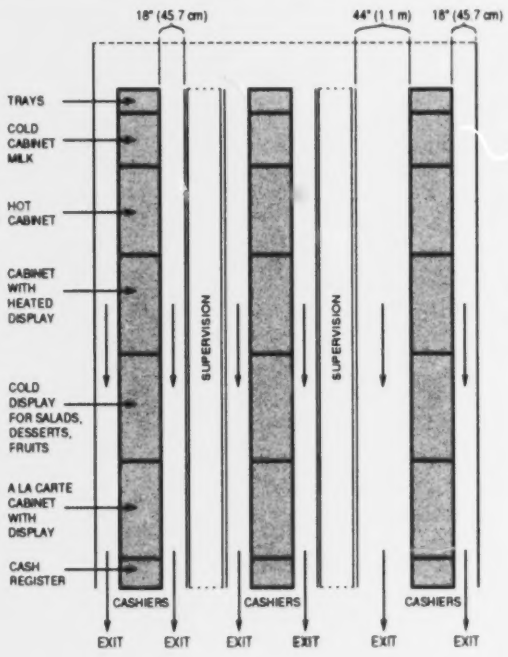


**Figure VI-2**
**Speed line**

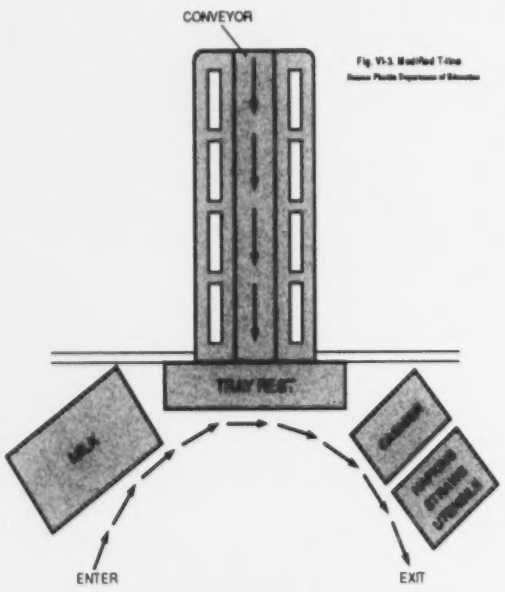


**Figure VI-3**
**Modified T-line**

*Source: Design Criteria: School Food Service Facilities.* Tallahassee: Florida State Department of Education.

2. *Number of serving lines or counters needed.* Generally, one traditional serving line or counter can serve 100 students within ten minutes. The length of a serving line (the serving counter) is usually determined by the number of foods offered. The speed of the serving method and the length of the counter will determine the number of customers that can be served at one counter.

   Some serving rates, in number of students that can be served per minute, are given in Table VI-2.

**TABLE VI-2**
**Serving Rates in Students per Minute**

| *Types of service* | *Students per minute* |
|---|---|
| Serving window | |
| Where orders are filled | 3 per minute |
| Where filled trays are picked up | 14–20 per minute |
| Straight-line service | 7–12 per minute |
| Speed-line service[a] | 20–28 per minute |
| Scramble service[b] | 20 per minute |
| Modified T-line | 14–20 per minute |

[a] Service is available on both sides in a speed line. Two cashiers will be needed to maintain a speed of 28 customers per minute, or a ticket system may be used that allows no a la carte sales on the line.

[b] The scramble service line allows customers to move from section to section, obtaining the foods they want, rather than waiting in a single line. Precautions must be taken to ensure that all items are paid for.

Modular serving units provide flexibility, and alterations can easily be made as service needs change. The height of the counter will differ with the grade levels of the students who use the facility, as shown in Table VI-3. The length of the serving line will depend on the type and number of food items that are offered. Aisles in service areas should be wide enough to allow wheelchair access.

**TABLE VI-3**
**Recommended Heights and Widths of Serving Units**

| *Equipment* | *Dimensions* |
|---|---|
| Counter's height on server's side | 34 to 36 in. (86.4 to 91.4 cm) |
| Tray rail's (slide's) height on customer's side (optional) | |
| Elementary | 30 to 32 in. (76.2 to 81.3 cm) |
| Secondary | 34 to 36 in. (86.4 to 91.4 cm) |
| Width of counter | 28 to 30 in. (71.1 to 76.2 cm) |
| Width of tray slides (if needed) | 12 in. (30.5 cm) |

3. *Equipment, materials, and serving practices.* Several factors should be considered when equipment and materials for the serving area are selected and when serving practices are established:
   a. At the point of service, hot foods should be held at 140 degrees Fahrenheit (60 degrees Celsius) or slightly hotter, and cold foods should be held at temperatures below 40 degrees Fahrenheit (4.4 degrees Celsius).
   b. Food on a serving line must be protected from contamination from airborne bacteria by a sneeze guard or by covered containers.
   c. The top of the serving counter should be of a heavy-duty gauge of stainless steel (see Section XI).
   d. The sides and front (customers' side) of the serving counter can be of a number of different materials, including fiberglass and stainless steel. The use of fiberglass allows the addition of color, which should be coordinated with the color(s) of walls and floors.
   e. Modular units that clamp together can be used to form a serving line that offers flexibility as needs change. Mobility[1] can be added with casters (5-inch [12.7-centimetre] heavy-duty casters are recommended). If casters are used, changes in counters' heights should be considered to maintain the heights recommended in Table VI-3.
   f. Sources of power and water and facilities for drainage should be assessed for adequacy.
   g. If a self-service facility is planned, the heights and reaches of students of varying age levels will need to be carefully calculated in order to maintain the counter heights that are recommended in Table VI-3.

4. *Sections of a serving area.* Serving areas typically are divided into sections. The cashier's section, approximately 2 feet (61 centimetres) long, should be at the end of the line so that cashiers can account for meals that are reimbursable. Electrical receptacles for computerized cash registers should be on dedicated lines; they should not be shared by the milk cooler, the ice cream cabinet, or other equipment. The cashier should be located where the trays can be viewed easily and for ease in the exchange of money, cards, or tickets. A cashier's stool may or may not be included in this section.

[1] Mobile units may or may not be addressed in the construction contract.

Trays, straws, napkins, and eating utensils should be located at the beginning of the line. The size and number of serving trays to be dispensed should be considered when determining the length of this section, which should be from 2 to 3 feet (61 to 91.4 centimetres) long. Straws, napkins, and utensils may be located in the dining room in a "free area."

The milk cooler is usually located on the serving line just before or after the trays or just before the cashier. The cooler should be a drop-front type, a both-side drop type, or a top-opening type that allows for easy self-service. This section should be from 3 to 6 feet (0.9 to 1.8 metres) long.

Turn-lock plugs that prevent easy disconnection may be desirable for milk coolers. Specifications that are prepared for the contractor will need to include these specialized outlets.

Stainless steel interiors or other surfaces that will not rust are recommended for coolers.

The size of the milk cooler will be determined by the number of customers to be served and the type of milk carton to be used.

Common capacities of milk coolers (linear dimensions) are as follows:

| | |
|---|---|
| 35-inch (88.9-centimetre) cooler | 730 1/2-pint (0.2-litre) peak cartons |
| | 1,001 1/2-pint (0.2-litre) flat cartons |
| 50-inch (127-centimetre) cooler | 1,095 1/2-pint (0.2-litre) peak cartons |
| | 1,280 1/2-pint (0.2-litre) flat cartons |

The hot-foods section of the serving line should be accessible from the cooks' area. Modules that hold 12 x 20-inch (30.5 x 50.8-centimetre) serving pans are standard for this section. The number of wells needed to hold serving pans is determined by the number of menu items to be served (four to seven menu items are most commonly offered). This section should be 5 to 6 feet (1.5 to 1.8 metres) long. The installation of lights and heat lamps over food should be considered.

The cold-foods section of the line is a flat or slightly lowered section for displaying salads,

relishes, breads, desserts, and butter. Frost tops (refrigerated areas) are desirable in this section. Shelves (one or more) located above the frost tops may be lighted for display of food.

The ice cream cabinet is often located in the serving line if ice cream is frequently on the menu or is to be sold a la carte. Turn-lock plugs that prevent easy disconnections should be considered for this cabinet. If any foods are to be stored in the cabinet, it should be lockable. The interior should be of a rustproof material.

If tray rails are to be provided in front of the food and cashier's sections, the closed-type rail with inverted V-ridges is preferable. The height of the tray rail should be carefully specified in accordance with the heights of the students to be served.

Ice machines are optional and may be located on the serving lines or in the serving area if beverages containing ice are to be offered. If used in a self-service area, the ice machine must have a dispenser.

Methods for replenishing lines with food, dishes, trays, and supplies should be considered when designing the serving line. Warming cabinets of many types are available. Refrigeration units should be near the serving line for convenience in replenishing operations.

5. *Menu boards and signs.* Menu boards or some means of communicating the day's offerings are needed. Signs and menu boards may or may not be part of the construction contract. The types of signs that are often needed include the following: IN and OUT over the entrance and exit of each serving area, NO SMOKING, MANAGER'S OFFICE, REST ROOM, and EMPLOYEES' LOUNGE. Back-lighted menu boards can be effective in marketing food items.

## B. Dining Areas

A dining area should not seat more than 500 students without being broken up in some manner, such as subdivided into two smaller areas or equipped with room dividers.

Students consume food in a variety of settings: in dining rooms, commons areas, picnic areas, gardens, classrooms (at desks), multipurpose rooms, and so forth. If outside dining space is to be offered, inside space should also be provided for use on rainy or windy days.

In most schools, dining areas are put to other uses as well. The most desirable arrangement is one in which the dining area can also be used as a multipurpose room. If such a multiuse area is planned, there should be separation between the dining areas and the serving and dish-return areas so that sounds from the kitchen and the dish-washing area do not disturb activities taking place in the dining areas.

In the planning of the acoustics of dining rooms, the ratio of sound-absorbing material to nonabsorbent material should be considered. Acoustic ceiling and wall materials, draperies, and wall hangings will absorb sound; window glass will not. Chairs with noise-resisting glides should be used if the room is not to have carpet. Carpeting is difficult to maintain in dining areas.

Doors and windows should open to the outside, with protection provided against flying insects. Doors should be self-closing.

The number of electrical outlets needed will depend on the uses for which the room is planned. Lighting controls should permit smaller areas of the room to be lighted separately. If the room is to be used for presentations or teaching, a means of reducing outside light should be provided. Electrical outlets should be installed at intervals.

Display areas should be provided for seasonal decorations, announcements, and menu displays. IN and OUT signs over serving areas are advisable.

The furniture that is chosen should be adaptable to the other uses that are planned for the dining area. The grade level of the students will determine the heights of tables and chairs (see Table VI-4). Stacking chairs are available in a variety of colors.

Tables in varying shapes, and particularly round tables, contribute to a social atmosphere. Booths and stand-up counters are popular with junior high and high school students. Folding rectangular tables are available in many lengths; 30 x 90-inch (76.2 x 244-centimetre) tables with four to six legs on casters and with laminated plastic tops are frequently used.

The atmosphere of the dining or eating area affects the way students feel and behave. Unfortunately, large numbers of students often must be seated in small areas, and when this is done by lining up long narrow tables, the facility takes on an institu-

tional look. Long tables encourage louder talking; smaller tables with adequate spaces between them encourage socialization and softer talking.

Central air-conditioning is desirable in most parts of California.

Planners may want to make the dining area accessible to nonschool groups without providing access to the entire kitchen or to other parts of the school.

Aisle space for one-way traffic should be a minimum of 36 inches (91.4 centimetres) wide; aisles for two-way traffic should be 60 inches (152.4 centimetres) wide.

Other dining room hardware and equipment that should be considered by planners include:

1. Refrigerated drinking fountains installed in accordance with local codes
2. Hand-type, wall-mounted fire extinguishers
3. In secondary schools, shelf space for students' books
4. Electric wall clocks
5. Attractive dish return receptacles and trash receptacles (see Section VIII)
6. Exit doors equipped with panic hardware

Additional information on dining areas appears in Section III.

**TABLE VI-4**
**Guide to Furniture Heights**

| *Grade levels* | *Height of tables* | *Height of chairs* |
|---|---|---|
| Elementary | 22–27 in.[a] (55.9–68.6 cm) | 12–17 in.[a] (30.5–43.1 cm) |
| Junior high | 27–29 in. (68.6–73.6 cm) | 15–17 in. (38–43.1 cm) |
| High school | 28–29 in. (71.1–73.6 cm) | 17–18 in. (43.1–45.7 cm) |

[a] A 22-in. (56-cm) table with 12- or 14-in. (30- or 35.6-cm) chairs may be desirable for kindergarten-age children.

# SECTION VII

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SECTION VII

# Offices and Employees' Facilities

Planners should consider the factors described below when designing and equipping areas for managers and employees.

## A. Manager's Office

The manager's office should be in a separate room with windows extending up from a point 4 feet (1.2 metres) above the floor. From here the manager can observe the kitchen, the storage spaces, and the receiving of orders. The lighting should be 75 to 100 footcandles without shadows.

The office space should be sufficient to accommodate the supplies a manager will need. Generally, the manager will need some or all of the following furniture and equipment:

1. File cabinet (two- or four-drawer legal- or letter-size with lock)
2. Ten-key calculator
3. Telephone
4. Typewriter (optional)
5. Schoolwide intercom from the main office
6. Desk(s) and chair(s)
7. Side chair
8. Clock
9. Computer and printer (optional)
10. Bookshelves
11. Space with privacy for counting receipts
12. Communication cables for computers and dedicated telephone and electrical lines if computers are used

## B. Employees' Areas

Toilet facilities should be located adjacent to or near the kitchen and serving areas. Separate facilities for men and women should be provided. A ventilation system will be needed for these facilities.

A hand sink should be located outside the toilet facilities and should be accessible to the food preparation area. It should have blended hot and cold water that is controlled by foot pedals or by faucets that are equipped with wrist-action handles. This sink should be of vitreous china or porcelain enamel on cast iron. Soap and towel dispensers or hot-air blowers are required. A mirror over the sink is desirable.

Locker space should be provided for each employee for the storage of purses, coats, and other personal belongings. A recommended locker size is 72 inches high by 15 inches wide by 18 inches deep (182.9 centimetres high by 38.1 centimetres wide by 45.7 centimetres deep). Lockers should have one shelf and be lockable with either built-in locks or a lock and hasp.

A chair or bench and possibly a full-length mirror should be located in the locker area. A 2 by 4-foot (0.6 by 1.2-metre) bulletin board for employee notices and announcements should be posted in the locker area, and a first-aid cabinet should be located in this area or in the manager's office.

A break room will be needed in larger facilities, particularly in food production centers and warehouses. If food service employees are not permitted to eat in the students' or faculty's dining room, an employees' eating area should be provided.

A pay telephone for employees' use may be desirable, particularly in large kitchens (15 or more employees) or in food production centers.

# SECTION VIII

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SECTION VIII

# Dish-Washing and Sanitation Areas

## A. Dish-Washing Areas

The sanitation and dish-washing areas should be located adjacent to the dining area and near the exit to it. They should also be adjacent to or part of the kitchen, but partitions should separate this area from the kitchen. A smooth flow of traffic in this area is critical, and the design should allow for (1) the return of trays in a continuous manner; (2) efficient disposal of waste and trash; (3) efficient washing and sanitizing of trays; and (4) the expeditious return of clean ware to use.

Grease traps, booster heaters, and the sizes of water heaters should be considered. Space sufficient for cleaning and sanitizing garbage cans and transportation equipment should be provided.

1. *Types of dish returns.* Conveyor belts or accumulators usually originate in the dining room and take trays and utensils to the dish-washing area. Dish-return windows are usually located near the exit of the dining area, and window enclosures shield the dish-washing area from view.

   Dish-return locations in secondary schools should be in convenient locations so that students will not be discouraged from busing their trays.

2. *Trash disposal.* Local laws that pertain to trash disposal must be considered. In many areas, trash must be sorted. In others, compacting or grinding methods are used. Regardless of the methods to be used, trash disposal facilities should be convenient, but they should not be located where they are offensive to diners.

   If recycling of trash is planned, the requirements for storage and the containers to be used in collecting and storing the waste should be carefully considered.

   Compactors and incinerators are two common means of decreasing the volume of trash. Compactors are often used when a school uses all disposable eating utensils. They are also useful when trash pickups are not as frequent as desired. Safety is a major consideration when locating a compactor. A water source is required. Burning in incinerators and grinding are others ways of reducing the volume of waste.

3. *Height of return counter.* The height of the counter to which dishes are to be returned from the dining room side should not exceed the following:

| | |
|---|---|
| Elementary school | 30 in. (76.2 cm) |
| Junior high school | 32 in. (81.3 cm) |
| High school | 34 in. (86.4 cm) |
| Combinations (grades 1–12) | 32 in. (81.3 cm) |

4. *Layout of the dish-washing area.* The sequence or flow of a dish-washing operation is shown in Figure VIII-1.

5. *Dish-washing machines.* The effectiveness of dish-washing machines can generally be determined by how many racks of dishes, trays, and so forth a particular model can handle per hour. One rack holds 16 to 18 9-inch (22.9-centimetre) plates, eight trays, or 100 pieces of flatware. To determine the size and type of dish-washing machine needed, planners must determine what will be washed and over what period of time. Most manufacturers rate their machines at 100 percent of capacity, but food service employees usually operate dish-washing machines at 70 percent of capacity. Among the

most common types of dish-washing machines are (1) single-tank stationary rack; (2) single-tank conveyor; (3) double-tank rack conveyor; (4) flight type; and (5) carousel type.

6. *Water temperatures required for dish washing.* The following minimum water temperatures are required for sanitary dish washing:

| | |
|---|---|
| Final rinse water (requires booster heater) | 180° to 190°F. (82.2° to 87.7°C) |
| Low-temperature chemical sanitizing | 120°F. (48.9°C) |
| Wash water | 120° to 160°F. (48.9° to71.1°C) |
| Low temperature | 120°F. (48.9°C) |
| High temperature | 160°F. (71.1°C) |
| Prerinse | 120° to 130°F. (48.9° to 54.4°C) |

The primary source of hot water (the water heater) should provide water at 120 to 140 degrees Fahrenheit (48.9 to 60 degrees Celsius). If higher water temperatures are needed, a booster heater can be used to increase the water temperature to 180 degrees Fahrenheit (82.2 degrees Celsius). The size and capacity of the booster heater will depend on the size of the dish-washing machine and the volume of water to be used.

7. *Compartment sinks.* The three-compartment-sink method of washing dishes is seldom used today; however, a three-compartment sink is required by some health departments for washing pots and pans if an automatic pot-washing machine is not available. This sink is a useful backup method when the dish-washing machine is out of service. If a three-compartment sink is used, desirable features will include:

a. Drain boards of integral metal (all one piece) at each end of the sink
b. Hot and cold water under pressure provided through a mixing valve to each sink (required on construction on or after January 1, 1985)
c. Stainless steel (14 to 16 gauge) manufacture
d. Sufficient capacity for immersion of pots and pans
e. Fast-flow faucets in large sinks
f. A splash board around the corner and across the end if the sink is located in a corner
g. Shut-off valves
h. A distance of 3 inches (7.6 centimetres) from walls or sealed to walls
i. Adequate floor drains
j. Indirect waste connection plumbing (required in California)

The layout and use of the three-compartment sink is shown in Figure VIII-2.

The recommended size for sinks is 24 inches (61 centimetres) high (floor to bottom of sink), 14 inches (35.6 centimetres) deep, and 24 inches (61 centimetres) wide.

Sink measurements are sometimes confusing. As used here, side-to-side = length, front-to-back = width, and top-to-bottom = depth. Standard lengths for drain boards are 18, 24, 30, and 36 inches (45.7, 61, 76.2, and 9.14 centimetres).

## B. Can-Washing Area, Mop Closet, and Garbage Area

With the use of plastic can liners, the can-washing area has become almost obsolete. When a can-washing and garbage area is established, it should be (1) lockable; (2) equipped with hot and cold water for washing trash cans and garbage cans; (3) equipped

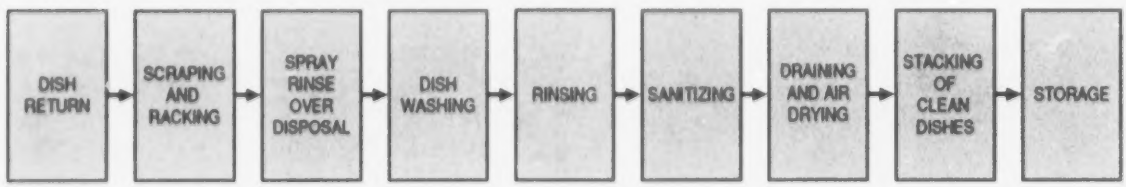



Figure VIII-1
Work flow in dish-washing area

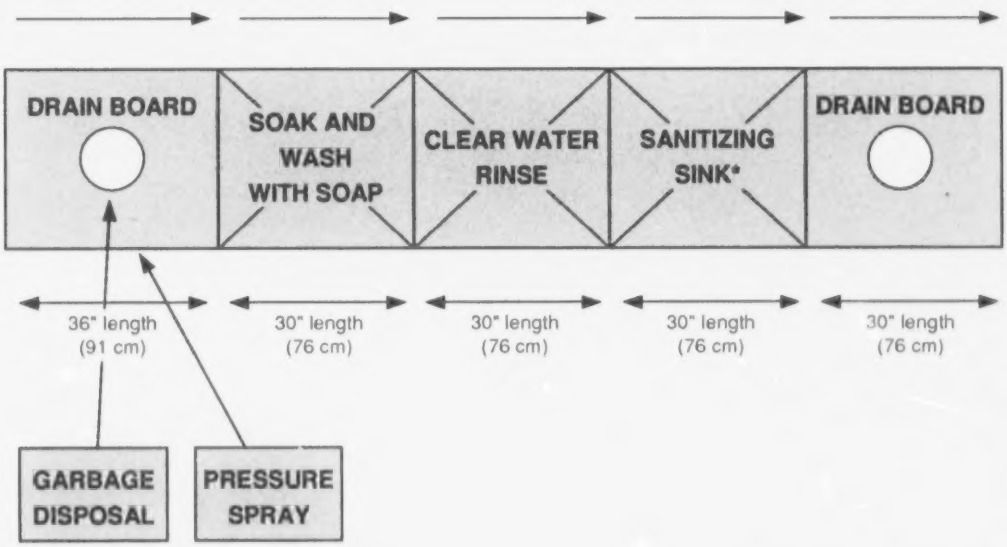
with a floor drain in a floor that is depressed a minimum of 3 inches (7.6 centimetres); and (4) equipped with water controls high enough to clear garbage cans (approximately 3 feet 6 inches [1.1 metres]). The can-washing area may also be used for cleaning and sanitizing transportation equipment.

The size of the garbage area will depend on the number and types of disposables to be used, the frequency of trash pickups, and the system of disposal. This area should have an outdoor entrance that is lockable, and it should be accessible from the loading platform.

The disposal of trash has become a major environmental concern. Current state and local regulations should be checked when planning this section of the building. The separation of trash is required in some jurisdictions, and the requirement could affect space needs. If trash is to be recycled, containers and space for storage may be needed.

Mop closets may or may not open into the receiving and kitchen areas. Space in closets should be adequate for the washing of mops and mop buckets and the storage of mops and brooms. A janitorial sink is required by the California Uniform Retail Food Facilities Law (CURFFL).

Mops used in the kitchen should not be used anywhere else. Hanging racks for mops and brooms are recommended; if mops used in other parts of the building are stored in the same mop closet, the racks must be marked "for kitchen use only." The mop closet may have shelves for the storage of cleaning materials.




*Sink is 24 inches high (61 centimetres) from floor to bottom of sink, 14 inches deep (35.6 centimetres), 24 inches wide (61 centimetres), 14-gauge stainless steel.

Sanitizing can be accomplished with chemicals and water heated to 70 degrees Fahrenheit (21.1 degrees Celsius)—120 degrees Fahrenheit (48.9 degrees Celsius) is recommended for faster drying—or with water heated to 180 degrees Fahrenheit (82.2 degrees Celsius). If sanitizing is to be done with hot water alone, the temperature of the wash water should be 140 degrees Fahrenheit (60 degrees Celsius) at the point of use and the temperature of the rinse water should be raised to 180 degrees Fahrenheit (82.2 degrees Celsius) at the manifold. This can be accomplished with a heater installed in the sanitizing section of the three-compartment sink.

**Figure VIII-2**
**Three-compartment sink**

# SECTION IX

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S E C T I O N

# Central Kitchens and Food Production Centers

In California a central kitchen (or base kitchen) is the facility where food is prepared for on-site service and for service at two or more sites (schools). A food production center is the facility where food is prepared for transportation to several other locations. Food production centers are sometimes called central kitchens. Central kitchens, including food production centers, are successfully used by many California school districts.

## A. Pros and Cons of a Food Production Center or Central Kitchen

When should a school district build a central kitchen? When should it build a food production center? The projected growth in the school district's enrollment over the next five to ten years should be a major factor in that decision. The costs and availability of skilled labor are other factors to be considered, as is the need to reduce the cost of producing and serving meals.

What will be the function of the food production center? Will it be used for baking and preparing food from raw ingredients or merely used as a distribution center for convenience foods? Will food be transported to school sites in bulk or as preplated meals? Will the food be transported hot and ready to serve, chilled, or frozen? How automated will the center be? What will be its capacity?

Whether to build a food production center or several central kitchens may be a difficult decision and even a controversial issue. California school districts have been forerunners in the concepts of central kitchens and production centers. Many districts have one or more central kitchens or a food production center. High labor costs and a shortage of labor have made it necessary for school districts all over the country to consider centralizing the preparation of food in order to gain efficiency. However, the cost of transporting the food to the schools where it is to be served must be considered when deciding whether food will be prepared on-site or at a central location.

The pros and cons of centralized food preparation are many:

**Pros:**

1. Labor costs per meal are significantly reduced.
2. Consistency of food quality is more attainable.
3. Management is more economical and efficient.
4. Equipment that is more automated and efficient can be used.
5. Food purchasing is easier to control, and food inventories in schools served by the center can be maintained at lower levels.
6. Vendors deliver larger quantities to one location, and because they make fewer delivery stops, they charge less.
7. Capital outlays for square footage and equipment are reduced.

**Cons:**

1. Individual schools have less control over their food service programs.
2. Menus may be more restricted.
3. Transportation and serving costs may offset the savings attained in meal preparation.
4. Transportation problems and problems that arise at central kitchens or food production centers may affect several schools.

5. Shorter-hour jobs may be harder to fill in kitchens at receiving schools.
6. Opportunities for students to participate in menu planning are reduced. If students do get involved, efficiency may be reduced at the production center.
7. Microbiological hazards may be increased because of the transportation of food.
8. The pleasant smells of food cooking at the schools will be missing.
9. Schools without kitchens or with limited kitchens and cooking equipment may feel shortchanged. Class projects that might ordinarily include food service may not be held because of the lack of a food service facility.

If meals are transported hot, they are generally prepared, transported, and served on the same day. The food is usually served from the same pan it is transported in, or it may be transported in already portioned dishes. The food is usually transported in insulated carriers. Food should be delivered as close as possible to the time of service. Pans and carriers may be returned to the central kitchen or production center on the same day or on the following day, depending on logistics. (See Section II for a discussion of the different systems that may be used.)

Food production centers and central kitchens require considerable space for storage, handling, and the staging of food transport carriers. The aisles that carriers must pass through must be wide enough to allow easy passage.

## B. Charting the Flow of Foods

Food production centers and central kitchens should be planned to operate as efficiently as possible and still provide the type of food desired. The planning process should include evaluation of various floor plans, and flowcharts should be prepared showing the progress of foods from storage as raw ingredients through preparation, through storage as prepared foods, and finally through distribution or staging.

In a large production facility, efficient work flow is crucial to keeping the unit cost of producing meals as low as possible. A careful analysis should be made of the sequence of each procedure, the storage space needed for raw ingredients and for finished products, and the space needed in the staging area.

The control of time and temperature should be considered in planning the movement of food. A diagram of the flow process can help identify the best location for a product, procedure, or the like. The standard symbols of the American Society of Mechanical Engineers, shown below, may be helpful in preparing such a diagram:

○ Operation ▽ Storage □ Inspection

⇨ Transportation D Delay

The flow of ingredients through the various stages should be smooth and continual—from delivery to storage, preparation, production, and shipping. Depending on the size of the facility, an ingredient room may be needed.

Other factors and equipment to be considered when planning a food production center or central kitchen include:

1. The avoidance of a "severe" industrial look
2. Air-blowing systems to move flour from storage into mixing bowls in large bakeries
3. Temperature-monitoring systems on all refrigerated units to alert employees when temperatures are not within desired ranges
4. Overhead signs to designate the various areas of the kitchen
5. A controlled room temperature of 50 degrees Fahrenheit (10 degrees Celsius) where meats and cheeses are sliced and cheese is grated
6. Adequate storage space for raw ingredients (generally, a five- to six-day inventory)
7. Adequate and proper storage space for finished products
8. An adequate staging area for deliveries
9. A system for controlling temperature and ventilation to provide a comfortable work environment (and encourage high productivity)
10. A covered loading dock
11. Aisles wide enough to accommodate a forklift
12. Good lighting with no shadows on work areas
13. Building materials selected with sound levels in mind
14. An ingredient issue area
15. An intercom system
16. An observation window in the manager's or supervisor's office
17. Offices in a mezzanine location
18. Time clocks, first-aid supplies, bulletin boards, and pay telephone
19. Adequate parking for employees

20. Employees' facilities that are adequate to accommodate all employees
21. A dock and driveway large enough to accommodate long, heavy trucks

If tours of the facility are planned, an enclosed walkway around the area will be useful for maintaining sanitation and ensuring safety.

Will the facility's source of steam require a trained and licensed engineer to be on duty at all times during which the steam generator is in use? Two or more smaller generators may be able to provide the steam needed and eliminate the need for an on-site engineer.

## C. Types of Food Production Centers and Central Kitchens

A food production center or central kitchen may or may not contain a bakery. It may produce foods only from raw ingredients or from a combination of prepared foods and raw ingredients. Methods for processing and delivering food include bulk cook/chill, bulk hot, bulk cook/freeze, preplated cold, and preplated hot. A kitchen that receives bulk cook/chill, bulk cook/freeze, or preplated cold foods will need equipment for reheating and serving the food. Food transported hot (preplated or bulk) is ready to serve.

The use of convenience foods in schools is increasing, partly because distributions of USDA commodities have been reduced and partly because of high labor costs and labor shortages. With increased use of convenience foods, some food production centers or central kitchens may serve merely as distribution or repackaging centers. A detailed comparison of costs is recommended, however, before a decision is made about the degree of production a kitchen is to engage in. Is it cost-effective to have a bakery? What will the bakery produce? What foods will be produced from raw ingredients, and is this method cost-effective? Will the quality be acceptable? These are questions to be answered only after careful study.

1. *Cook/chill or cook/freeze system.* The automated cook/chill or cook/freeze system is most suitable for large-volume production, but smaller locations are using modified versions of this system. Typically, food is prepared in a central kitchen or production center and, while still hot, is bagged in airtight polyethylene bags, chilled (or frozen), and stored for later use. Food may be stored and transported in serving counter pans or in the pans in which it is to be heated.

   Bags of prepared food can be chilled very quickly and need less storage space than food placed in pans. Under controlled procedures, the shelf life of food refrigerated at 28–30 degrees Fahrenheit (–2.2 to –1.1 degrees Celsius) is up to 42 days; however, sterilization procedures must be followed, and bacteria counts should be taken frequently to ensure the safety of the food. At the time of service, the food is reheated to serving temperature in the bags in a kettle or is removed from the bags and heated in a steamer or oven.

   The most frequently used equipment in a cook/chill system includes:

   a. A 150- to 200-gallon (567.8- to 757-litre) agitator kettle
   b. A pump/filling station
   c. A tumbling chiller/blast chiller
   d. A component control system
   e. A hydraulic drive system
   f. A heat exchange package
   g. A steam generator
   h. A vacuum clipper/tipper tie
   i. An air compressor
   j. An internal meat-temperature probe
   k. Conveyor ovens

2. *Bulk hot food system.* When food is transported hot, close scheduling and proper equipment are required to maintain a safe temperature until the time of service. Hot cabinets come in numerous sizes and varieties. The sizes and weights of these cabinets may need to be considered when planning loading docks.

   Bulk hot food is transported primarily to schools that have no kitchens or ovens for heating food. Timing is critical to the quality and safety of the food, and holding times should be kept to a minimum.

3. *Preplated meals.* Preplated meals may be the most cost-effective to produce in some school districts. (Remember that transportation costs must be considered in such a system.) A preplated meal system can be highly automated and very efficient. Portioning of food into trays of one, two, and three compartments usually takes place on a conveyor belt. Equipment commonly used in

automated kitchens in which food is preplated includes:

a. Conveyor belts (single- or double-lane)
b. Automated tray dispensers
c. Hand-pack stations
d. Pump fillers
e. Rotary volumetric fillers
f. Count fillers
g. Foil hooders and crimpers or shrink-wrap film sealers for hot trays
h. Plastic film heat sealer for hooding cold trays
i. Accumulation and transfer equipment
j. Pillow pack automatic wrapper

Production rates can be as high as 150 to 180 trays per minute in a single-lane operation. The preplated meals are usually assembled and delivered cold for reheating before serving.

The square footage needed for this type of operation will depend on the method (bulk or preplated) and volume of meal production. (See Section II for a discussion of the pros and cons of the various food service systems.)

# SECTION X

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S E C T I O N

# The Food Service Warehouse

Should a school district have a central warehouse for the storage of food? The answer to this often-asked question is yes if a warehouse would be cost-effective and if it would meet a need that cannot be met by other means.

## A. When Is a Warehouse Needed?

Schools' requirements for storage space can be reduced if the district opts for a central warehouse. The following questions should be answered before a decision to build a food warehouse is made:

1. Would the cost of food delivered to a central warehouse be as much as 15 percent less than the cost of food delivered by vendors directly to schools?
2. Has the school district had problems with the quality of products delivered to schools? Do these delivered products meet specifications?
3. Does the school district receive deliveries as frequently as needed? Does the distribution of USDA commodities present problems or add costs?
4. How much will it cost to operate the warehouse and deliver products to the schools? How many trucks will be needed—refrigerated and nonrefrigerated? How cost-effective will this operation be?
5. What are the goals of the food service department? How would a central warehouse contribute toward meeting those goals?
6. What would be the cost of a roadway and turnaround area for heavy trucks?

## B. Inventory to Be Stocked

What should the warehouse stock? A lot of money can be tied up in inventory if all food items and supplies are stored. It is often more effective to stock mostly high-volume items, including USDA commodities. With such an arrangement, the school district would still be able to bid with distributors for the delivery of low-volume items; e.g., vanilla flavoring, baking powder, and pepper. Typical high-volume items might include meats, poultry, pizza products, potato products, canned fruits, canned vegetables, and USDA-donated commodities.

## C. Space Requirements

Warehouse storage space is measured in cubic feet of capacity (gross interior space). Food is usually stored on pallets. The space required will depend on the inventory; that is, the quantity and volume of items to be stored (see Table X-1). If square footage is limited, a compact warehouse can be built that is four or five tiers high and two tiers deep, or a high-density storage system can be used. High-density systems involve moving shelves on tracks and have many advantages, including efficiency, reduced floor space, security, and ease of automation.

The receiving area should be large enough to permit the efficient transfer of food and supplies. Scales and a table for opening samples of goods received for storage should be provided in the receiving area.

**TABLE X-1**
**Guide for Determining Storage Space in a Central Warehouse**

| *Stock* | *Type of storage* | *Cu. ft. (cu. cm) per meal* | *Number of meals* | *Number of days for which an inventory is maintained* | *Total* [a] |
|---|---|---|---|---|---|
| Staples | Semiperishable | 0.03 (0.08) | | | |
| Canned fruits, meats, vegetables | Semiperishable | 0.01 (0.03) | | | |
| Disposables and detergents | Dry | 0.02 (0.6) | | | |
| Meats/entrees | Frozen | 0.025 (0.07) | | | |
| Vegetables, fruits | Frozen | 0.015 (0.42) | | | |
| Dairy and produce | Refrigerated | 0.010 (0.03) | | | |

[a] Total is cubic feet (cubic centimetres) × number of meals × number of days for which an inventory is maintained.

Example: Assuming that 20,000 meals are served per day and a 20-day inventory is maintained, 24,000 cubic feet (679.2 cubic metres) of space would be needed for dry and semiperishable foods, 16,000 cubic feet (452.8 cubic metres) of space would be needed for frozen foods, and 4,000 cubic feet (113.2 cubic metres) of space would be needed for refrigerated foods. Total space needed: 44,000 cubic feet (1245.2 cubic metres).

Recommended temperatures for storing goods in a warehouse are the following:

1. Semiperishable foods, 40 to 70 degrees Fahrenheit (4.4 to 21.1 degrees Celsius)
2. Frozen foods, –10 degrees Fahrenheit (–23.3 degrees Celsius)
3. Refrigerated foods, 35 degrees Fahrenheit (1.7 degrees Celsius)

## D. Division of Warehouse Space

How much space in a warehouse should be freezer space? How much should be refrigerator space? The answers to these questions will depend on the school district's location, the frequency of deliveries, the number of meals to be served, the menus to be selected, the types of foods to be served (e.g., canned vegetables or frozen vegetables), the quantity of prepared foods to be purchased, and the number of items to be stocked. Many districts prefer frozen foods to canned foods. Many kinds of refrigerated food (e.g., milk and produce) may be delivered directly to schools. However, some school districts have found it cost-effective to store these items in a central location and deliver them to schools as needed. Generally, a 50/10/40 division of storage space is desired—50 percent dry, 10 percent cooler (refrigerator), and 40 percent freezer. However, if disposable items (trays, plates, eating utensils, and so on) are to be stored, this division may be considerably different. If milk (beverage) and/or produce are to be stored, more cooler (refrigerator) space will be needed. If many foods are to be prepared from raw ingredients (e.g., breads), more dry storage will be needed.

The net area in a warehouse that is available for storage is the important area, because food and supplies can be stored only in this area. The gross square footage of a warehouse will include space for receiving and shipping, space around doors, main and cross aisles, and so forth. Staging areas where outgoing orders are assembled may take up a significant amount of space and should be considered in the planning process. Net storage typically is about 60 percent of the gross storage area. Guidelines are provided in Table X-1 for estimating the space needed for the various food categories.

1. *Docks.* How long should a loading dock be? How many docks are needed? In most cases, a dock that will accommodate two to four trucks will be sufficient. If the same dock is to be used for receiving

and distribution, deliveries to the warehouse may have to be scheduled. Hydraulic-lift docks with self-contained power units that are 6 feet by 6 feet (1.8 metres by 1.8 metres) in size are suggested. The fewer trucks a dock will accommodate, the tighter the scheduling of deliveries must be.

2. *Security*. The facility should not have windows or doors that lead outside except for emergency exits. These exits should be equipped with alarms and should be clearly visible from the front office. Locks should not be part of the master lock system but rather should be on a separate system.

   Refrigerators and freezers should be equipped with alarm systems that will alert maintenance personnel if the internal temperatures rise above safe levels. Temperatures in freezers and refrigerators should be checked at predetermined intervals and recorded.

   Temperatures in the dry storage area should be maintained between 50 and 70 degrees Fahrenheit (10 and 21.1 degrees Celsius) in order to meet the USDA's requirements for donated commodities. Insect and vermin control are important to the facility.

3. *Miscellaneous needs*. Office space and employees' facilities, including a break area, should be provided. A lobby or waiting area with rest rooms will be needed for truck drivers. A time clock, first-aid supplies, and a bulletin board for employees will also be needed. Be sure to allow storage space for the equipment that is to be used in loading and unloading and for battery chargers. A first-aid area that includes a small eyewash sink and lockers for the storage of insulated (refrigerator) clothing should be provided.

   Equipment (including scales) and space for paperwork should be located in the receiving area. A test kitchen, located in or adjacent to the warehouse, is desirable.

   The refrigeration compressor should be accessible for maintenance. An auxiliary source of electricity should be considered. If electrical power were interrupted for two days, would the warehouse suffer a big loss? A backup electrical generating system should be planned for emergencies.

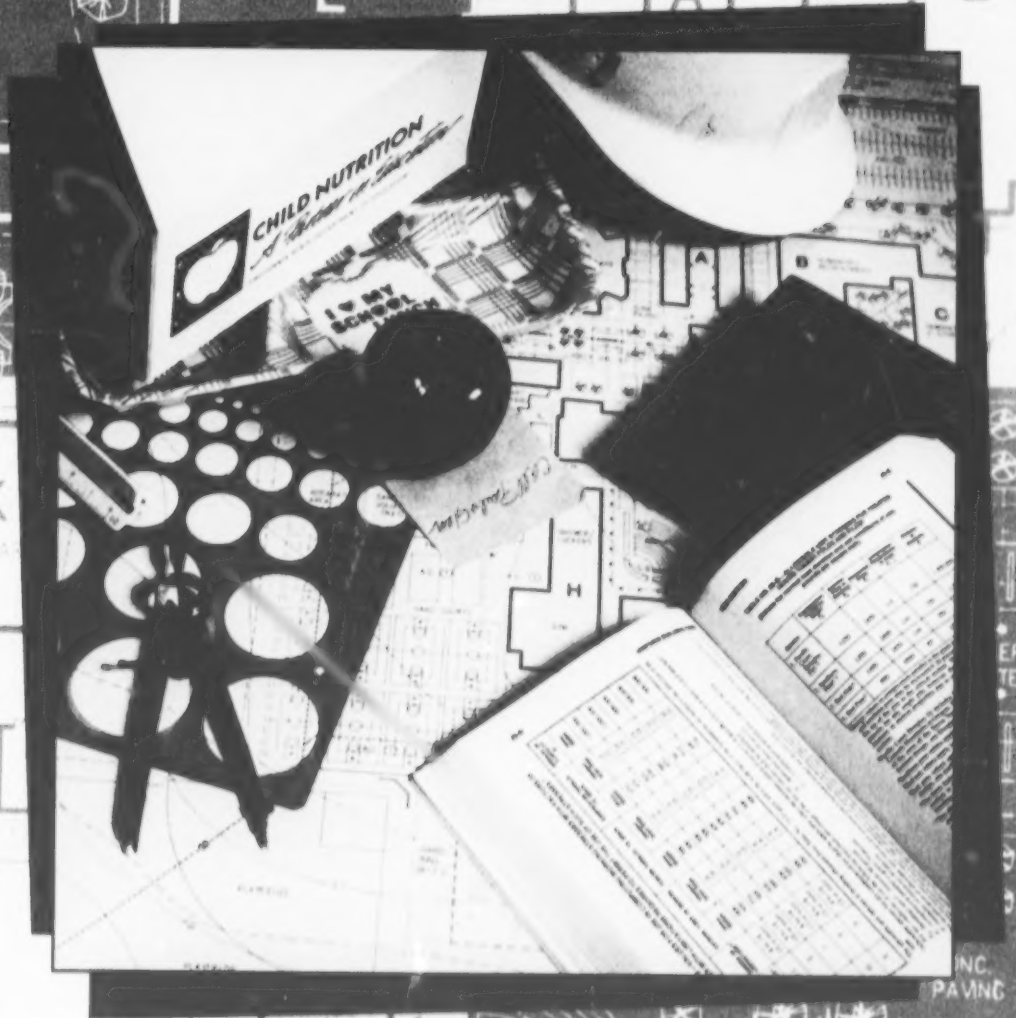
## E. Layout and Location

The flow of products at the warehouse should be as direct as possible. For efficiency, the receiving dock should be at trailer-truck–bed height—approximately 4 feet (1.2 metres). The warehouse floor should be at the same level as the dock. For energy efficiency, the refrigerated area can lead into the freezer area. However, for labor efficiency, this may not be the best arrangement.

Ideally, the warehouse will be in the center of the district or in the most accessible area in the district, and the location should be convenient to the central kitchen. The road and entrance to the dock area and exit should be large enough to accommodate large, heavy trailer trucks and to provide parking for smaller delivery trucks.

# SECTION XI



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S E C T I O N

# Specifications and Blueprints

## A. Equipment Specifications

This guide is not intended to provide complete details for writing specifications for equipment. However, since writing specifications is an important part of planning a new facility, and since the requirements for equipment will need to be addressed before a layout of equipment can be designed, some of the basic elements of specifications are listed below:

1. *Accessories:* Very important in many cases but can add significantly to costs.
2. *Adjustments:* On-site calibration of thermometers required.
3. *Delivery date:* Specify a range of dates.
4. *Demonstration:* On-site demonstration required.
5. *Description:* Only as detailed as necessary.
6. *Generic names* (e.g., work tables, ovens, milk coolers).
7. *Item numbers:* Same numbers as used in drawings.
8. *Manual (including a list of parts):* Three or four copies to be provided (one for the kitchen manager, one for the maintenance department, and one for the office in which food service files are kept).
9. *Price FOB.*[1]
10. *Quantities:* Numbers to be provided.
11. *Seals of approval:* Underwriters' Laboratories, National Sanitation Foundation, American Gas Association, and so on.
12. *Sizes:* Length, width, height, number of gallons, and so on.
13. *Standards:* May be used with model and manufacturer and the phrase *or equal.*
14. *Training:* Required if equipment is unusual or employees are new.
15. *Utility requirements:* Also local codes (e.g., anchoring).
16. *Warranty:* One year parts and labor if the equipment has working parts.

[1] Destination of delivery is important (on loading dock, inside building, and so on). It may be advisable to specify that the equipment must be uncrated (with crates removed from premises) and set in place.

The food service facility's consultant will in most cases be responsible for the actual writing of specifications. The consultant may be able to introduce the food service director to new concepts and systems, but it is the food service director who should determine the system to be used and the equipment that will be furnished.

Equipment should be of good quality and should be chosen from among recognized brands. Gas-fired equipment must have the approval of the American Gas Association (AGA); steam-heated equipment must be approved by the American Society of Mechanical Engineers. Electrically heated or operated equipment should bear the seal of approval of Underwriters' Laboratories and should conform to the *National Electrical Code.*

Fabricated equipment should be avoided if a standard piece of equipment can function as well. It is preferred that fixed equipment that requires electrical wiring, drainage, and water, steam, and/or gas sources be part of the construction contract. The contractor will then have responsibility for the delivery, installation, and demonstration of this equipment.

Specifications should require (1) the manufacturer to provide parts during the life of the equipment; and (2) service by authorized technicians for a specified period of time. A one-year warranty should be provided for equipment that has working parts.

High-quality, heavy-duty equipment should be selected. Standards for food service equipment are provided in the following pamphlets of the National Sanitation Foundation (NSF):

*No. 1—Soda Fountain and Luncheonette Equipment*
*No. 2—Food Service Equipment*

*No. 3—Commercial Spray-Type Dish-Washing Machines*
*No. 4—Commercial Cooking and Hot Food Storage Equipment*
*No. 5—Hot Water-Generating and Heat-Recovery Equipment*
*No. 6—Dispensing Freezers*
*No. 7—Food Service Refrigerators and Storage Freezers*
*No. 8—Commercial Powered Food Preparation Equipment*
*No. 12—Automatic Ice-Making Equipment*
*No. 18—Manual Food & Beverage Dispensing Equipment*
*No. 25—Vending Machines for Food & Beverages*
*No. 26—Pot, Pan and Utensil Washers*
*No. 29—Detergent/Chemical Feeders for Commercial Spray-Type Dish-Washing Machines*
*No. 37—Air Curtains for Entranceways in Food Establishments*
*No. 59—Food Carts*

The equipment covered by the standards provided in these pamphlets must be approved by the NSF and bear the foundation's seal.

Stainless steel is commonly used in the manufacture of kitchen equipment. It is durable, easy to clean, does not rust, and lasts a long time. A commonly used stainless steel is U.S. Standard 18-8 gauge, Type 302, which means it is 18 percent chromium and 8 percent nickel and is nonmagnetic. (See Table XI-1 for recommended thicknesses of stainless steel.) Equipment that is not stainless steel should have finishes that are easy to clean and parts that will withstand the intended uses without rusting, bending, or cracking.

**TABLE XI-1**
**Recommended Thicknesses for Stainless Steel**

| *Item* | *Gauge number* | *Thickness* |
|---|---|---|
| Pot-wash sinks, tops of tables, serving lines, sinks, and shelves | 14 | 5/64 in. (2 mm) |
| Side panels and tops of equipment, table legs, and flooring of refrigerators | 16 | 1/16 in. (1.6 mm) |
| Hoods | 18 | 3/64 in. (1.2 mm) |
| Insides of drawers and doors | 20 | 1/32 in. (0.8 mm) |

If the food service facility's consultant will be providing equipment specifications, the food service director's role will be to provide the consultant with brochures or "cut sheets" on specific pieces of equipment that are desired and to review carefully the equipment under consideration and its layout.

## B. Architectural Drawings

Architectural drawings or blueprints are made up of lines, notes, and symbols that represent architects' "shorthand." An initial drawing is referred to as a schematic. Final drawings, referred to as working drawings, are rendered in great detail and are provided to the various groups that do the construction—plumbers, electricians, carpenters, and so forth.

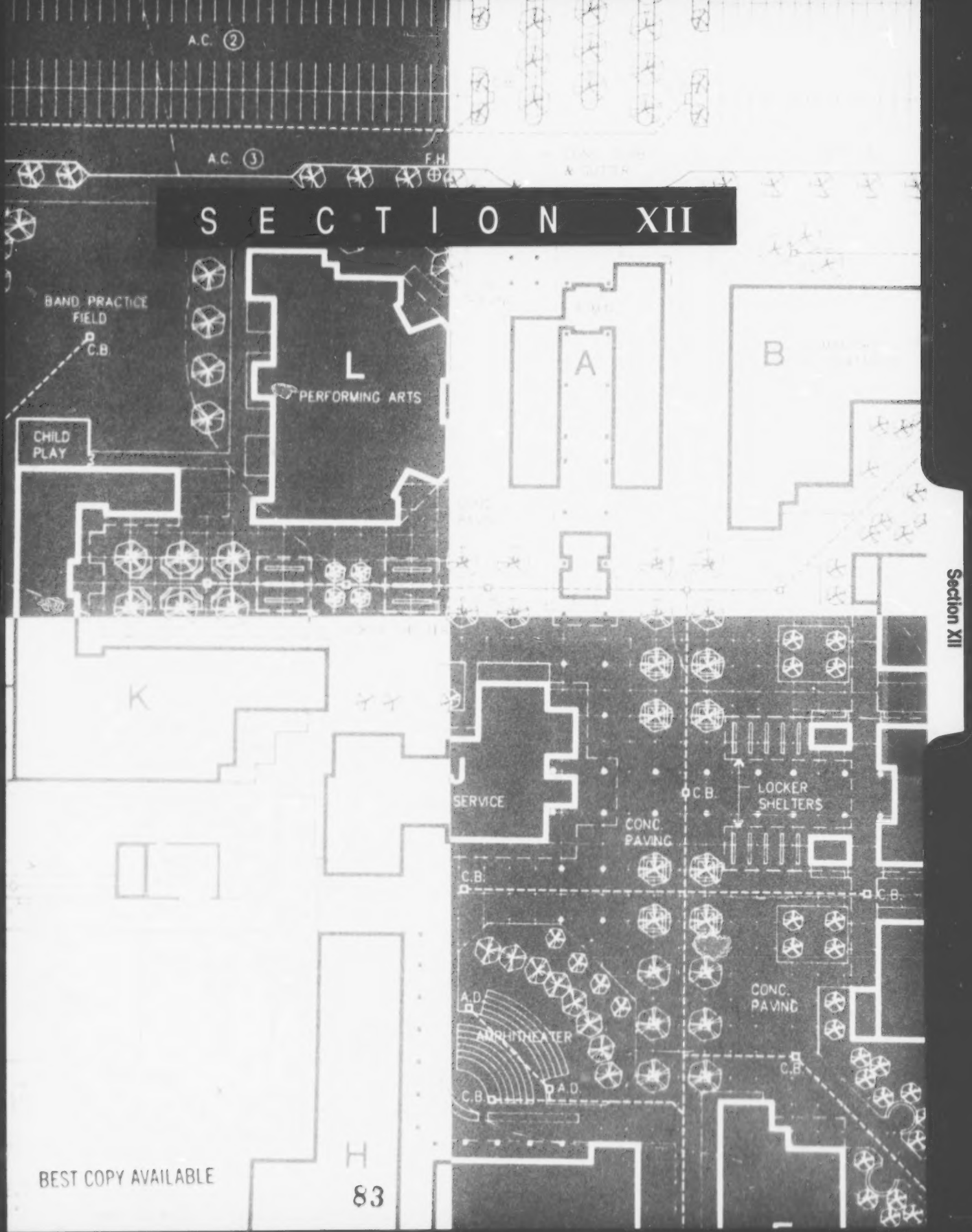
Most blueprints are drawn to a scale of ¼ inch (0.6 centimetre) equals 1 foot (30.5 centimetres). The ability to read and understand floor plans comes from experience gained over a period of time. The reader must be able to visualize the plan's concept and the equipment layout in scale form and must have knowledge of the symbols used. This information is often contained in the plan. A schedule in the corner of the top plan sheet will usually indicate walls, floors, wood finishes, and ceiling materials. Appendix C contains some of the commonly used symbols and templates. Appendix D contains a sample floor plan of a production kitchen.

Heavy, solid lines in drawings indicate walls, and the space between two solid lines indicates the thickness of walls. Three to four single parallel lines at a break in the walls indicate windows. The direction in which a door will open is indicated by an arc from the base of the line to the single line swung outward.

Equipment templates show the placement of equipment in its proper size and relationship. Numbers within the drawings relate to numbered descriptions in the schedule at the bottom of the floor plan.

It may help to visualize the equipment layout if the layout is chalked out on a large floor area at full size, complete with work space and aisles. Props can be used in this layout to see whether the areas allotted are adequate for the work to be performed and to ensure that the work flow can proceed without traffic problems between work areas.

It is also important to determine whether proposed menus can be prepared with the equipment that is specified and in the proposed configuration of equipment.




Section XII

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# Evaluation of the Completed Facility

A checklist should be used in determining whether the completed facility meets specifications and is built in accordance with the blueprints. The checklist should be based on information that was clearly defined and specified during the early stages of planning. Once the facility is completed, making changes that are not reflected on blueprints or in specifications will be very expensive.

A sample checklist is included in this section. Actual checklists will vary depending on the facility. It may be helpful to add items to the checklist throughout the planning and construction processes.

## Sample Checklist for Completeness of Facility

| Item | *In accordance with blueprints/ specifications* | *Change necessary to operate*[a] |
|---|---|---|
| **A. Structural Aspects** | | |
| 1. Arrangement of stationary equipment | _____ | _____ |
| 2. Seismic restraint of equipment | _____ | _____ |
| 3. Material used | _____ | _____ |
| 4. Lighting | _____ | _____ |
| 5. Footcandles in office | _____ | _____ |
| a. In storeroom | _____ | _____ |
| b. In walk-ins | _____ | _____ |
| c. In kitchen | _____ | _____ |
| d. In serving area | _____ | _____ |
| e. At cashier's stand | _____ | _____ |
| f. In dining area | _____ | _____ |
| 6. Convenience outlets | _____ | _____ |
| 7. Placement of clocks for viewing | _____ | _____ |
| 8. Dedicated lines for computers and cash registers | _____ | _____ |
| 9. Telephone placement | _____ | _____ |
| 10. Placement of loudspeaker system | _____ | _____ |
| 11. Receiving area | _____ | _____ |
| 12. Floors of walk-in freezer and refrigerator—level with kitchen floor | _____ | _____ |

**Sample Checklist for Completeness of Facility *(continued)***

| Item | *In accordance with blueprints/ specifications* | *Change necessary to operate*[a] |
|---|---|---|
| 13. Flow of work | _____ | _____ |
| 14. Aisle space in kitchen | _____ | _____ |
| 15. Aisle space in dining area | _____ | _____ |
| 16. Widths of aisles to accommodate the handicapped in serving area | _____ | _____ |
| 17. Emergency lighting | _____ | _____ |
| 18. Loading/unloading area | _____ | _____ |
| 19. Door leading from outside | | |
| a. Width | _____ | _____ |
| b. Window | _____ | _____ |
| c. Closer | _____ | _____ |
| d. Light and bell | _____ | _____ |
| e. Fly fan | _____ | _____ |
| f. Security and lock | _____ | _____ |
| 20. Vermin and rodent protection | _____ | _____ |
| 21. Trash removal and storage | _____ | _____ |
| 22. Hot and cold water for hose bibbs and cleanup | _____ | _____ |
| 23. Inclines in floor level | _____ | _____ |
| 24. Drains' acceptance of flow of water or other liquids | _____ | _____ |
| 25. Drains provided for equipment | _____ | _____ |
| 26. Electrical voltage for all equipment | _____ | _____ |
| **B. Operational Factors** | | |
| 1. Ventilation and temperature in kitchen _____°F. | _____ | _____ |
| 2. Temperature required by USDA in storeroom _____°F. | _____ | _____ |
| 3. Fire extinguishing system tested and demonstrated | _____ | _____ |
| 4. Three-compartment sink's water temperature | _____ | _____ |
| 5. Flow of water and time required to fill pot sink | _____ | _____ |
| 6. Temperature of refrigeration units | _____ | _____ |
| 7. Temperature of hot food tables | _____ | _____ |
| 8. Steam source for steam equipment | _____ | _____ |
| 9. Dish-washing machines' temperatures in all cycles | _____ | _____ |
| 10. Sound level tolerance | _____ | _____ |

Sample Checklist for Completeness of Facility *(continued)*

| Item | *In accordance with blueprints/ specifications* | *Change necessary to operate*[a] |
|---|---|---|
| 11. Electrical current | | |
| 12. All equipment able to operate at same time | | |
| 13. Health department's approval | | |
| 14. Fire department's approval | | |
| **C. Equipments' Readiness** | | |
| 1. UL's approval of all appropriate equipment | | |
| 2. NSF's approval of all food service equipment | | |
| 3. All equipment operational[b] | | |
| 4. All options and accessories on-site and correct | | |
| 5. Height of serving line and work tables | | |
| 6. Finish of all equipment (interior/exterior) | | |
| a. Interior of milk cooler | | |
| b. Interior of ice cream cabinet | | |
| c. Flooring of walk-in units | | |
| d. Work tables, drawers, shelves, and so on | | |
| 7. Height of dining tables and chairs | | |
| 8. Equipment safe to operate | | |
| 9. Thermostats on equipment adjusted | | |
| 10. Equipment operating manuals and parts manuals provided | | |
| 11. Telephone numbers for service under warranty provided | | |
| **D. Miscellaneous Items** | | |
| 1. Menu display and signs | | |
| 2. Hand sink—hot/cold water | | |
| 3. Towels and hand soap dispensers, mirror | | |
| 4. Back-siphonage protection on specified equipment | | |
| 5. Employees' toilets operational and private and meet requirements for the handicapped | | |
| 6. Lockers for employees | | |
| 7. Pay telephone | | |
| 8. Manager's office | | |
| 9. Storeroom and refrigeration units lockable, key provided | | |
| 10. Mop closets, for kitchen only | | |

**Sample Checklist for Completeness of Facility *(concluded)***

| *Item* | *In accordance with blueprints/ specifications* | *Change necessary to operate*[a] |
|---|---|---|
| 11. Equipment warranties completed and recorded | _____ | _____ |
| 12. Electrical panel box labeled | _____ | _____ |
| 13. Water and gas shutoff valves identified and labeled | _____ | _____ |
| 14. Temperature and security alarm for walk-in refrigerator | _____ | _____ |
| 15. Security system for kitchen | _____ | _____ |

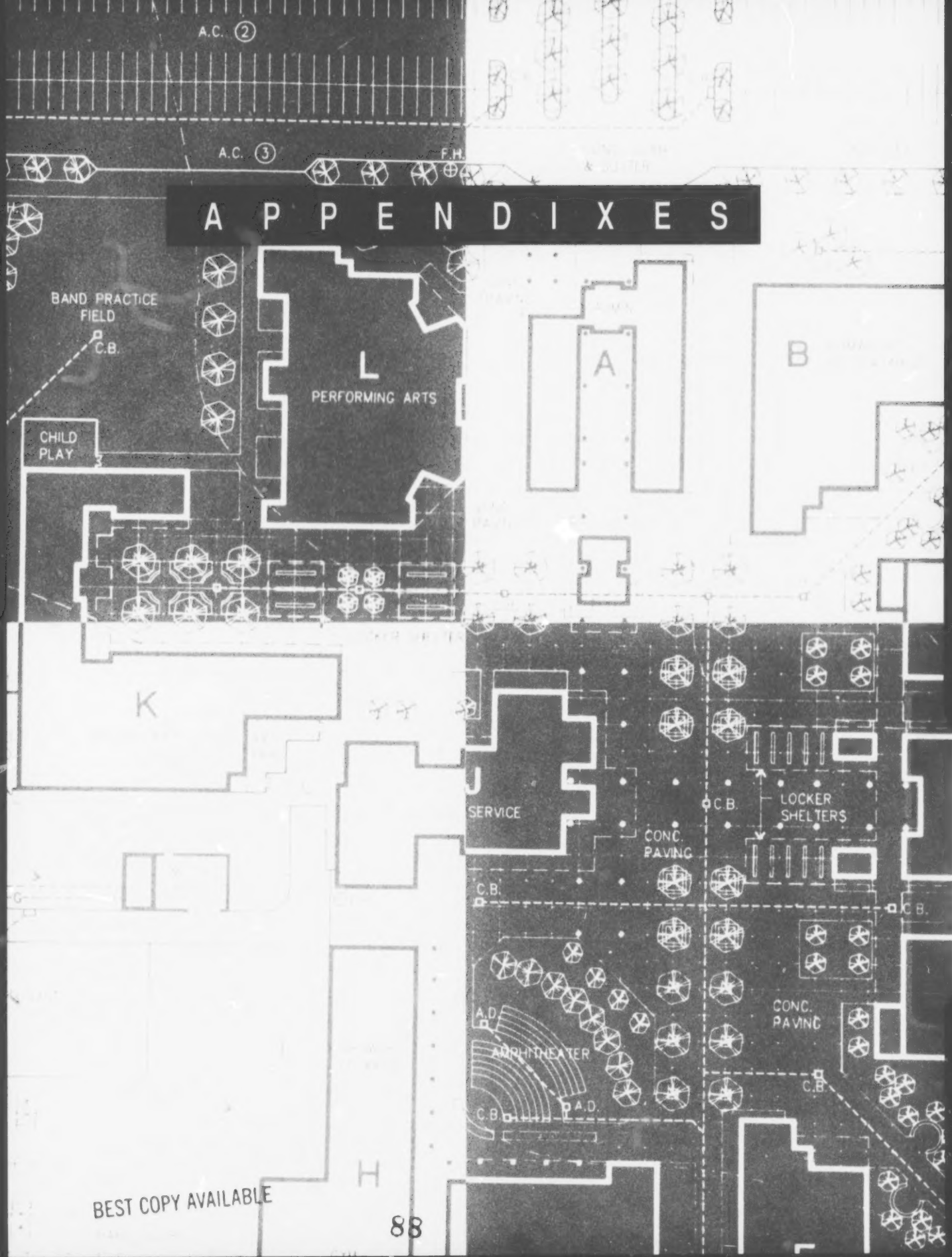
Signature of person completing checklist: _____

Title: _____

Date: _____

[a] Changes from what was prevously approved on blueprints or specifications are usually very expensive.
[b] All operations and features have been tested.

# APPENDIXES



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# APPENDIX A

# The California Uniform Retail Food Facilities Law

Excerpted from the *California Health and Safety Code**

Enacted in June, 1984, with amendments through January 1, 1987

Administered by the California Department of Health Services

Enforced by local health departments

## *Health and Safety Code*
## Contents


**Article 1. Declaration of Policy and General Provisions**

Section 27500. Title of Law
Section 27501. State Law Preemption
Section 27502. Adoption of Regulations by the State
Section 27503. Local Grading Systems; Training Programs; Regulatory Authority
Section 27504. Cross Reference of Chapter 4 to Repealed Chapters
Section 27505. Enforcement, Nonduplication and Review
Section 27506. Reference to Applicable Building Codes

**Article 2. Definitions**

Section 27510. "Adulterated"
Section 27511. "Approved"
Section 27512. "Certified Farmers' Market"
Section 27513. "Commissary"
Section 27515. "Employee"
Section 27516. "Enforcement Agency"
Section 27517. "Enforcement Officer"
Section 27518. "Equipment"
Section 27519. "Food"
Section 27520. "Food Establishment"
Section 27521. "Food Facility"
Section 27522. "Food Preparation"
Section 27523. "Frozen Food"
Section 27523.7. "Hearing Officer"
Section 27524. "Hot Dog"
Section 27525. "Impound"
Section 27526. "Mobile Food Preparation Unit"
Section 27527. "Multiservice Utensil"
Section 27528. "Occasional Event"
Section 27528.5. "Open-Air Barbecue Facility"
Section 27529. "Permit"
Section 27530. "Person"
Section 27531. "Potentially Hazardous Food"
Section 27532. "Produce"
Section 27533. "Produce Stand"
Section 27534. "Refrigeration Unit"
Section 27535. "Remodeled"
Section 27535.5. "Restricted Food Service Transient Occupancy Establishment"
Section 27536. "Retail"
Section 27536.5. "Satellite Food Distribution Facility"
Section 27537. "Single Service Utensil"
Section 27537.5. "Stationary Mobile Food Preparation Unit"
Section 27538. "Temporary Food Facility"
Section 27539. "Utensil"
Section 27540. "Vehicle"
Section 27541. "Vending Machine"


*Updated excerpts from the *Health and Safety Code* can be obtained from the California Department of Health Services, P.O. Box 942732, Sacramento, CA 94234-7320.

**Article 3. Plan Review and Permits**

| | |
|---|---|
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**Article 4. Enforcement and Inspection**

| | |
|---|---|
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| Section 27562. | Penalty Provisions |
| Section 27563. | Responsibility for Violations |
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**Article 5. Permit Suspension or Revocation**

| | |
|---|---|
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| Section 27581. | Hearing Decision Notification |
| Section 27582. | Permit Suspension Due to Immediate Danger to the Public Health and Safety |
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**Article 6. General Sanitation Requirements**

| | |
|---|---|
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| | |
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| Section 27602. | Chinese-Style Roast Duck Exemption |
| Section 27603. | Food Protection |
| Section 27604. | Food Reservice; Private Home Prohibition; Bakery Product Wrapping |
| Section 27605. | Employee Health Requisites |
| Section 27606. | Poisonous Substances Storage and Use |
| Section 27607. | Vermin Entrance and Harborage |
| Section 27608. | Solid Waste Storage and Disposal |
| Section 27609. | Litter, Rubbish, and Vermin on Premises |
| Section 27610. | Animals, Birds, and Fowl Exclusion and Exceptions |
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| | |
|---|---|
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| Section 27622. | Frozen Foods; Thawing |
| Section 27623. | Utensil and Equipment Washing, Sanitization, and Storage; Equipment, Materials and Maintenance |
| Section 27624. | Water Source and Temperature; Hoses |
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# Chapter 4. California Uniform Retail Food Facilities Law

### Article 1. Declaration of Policy and General Provisions

27500. This chapter shall be known and may be cited as the California Uniform Retail Food Facilities Law.

27501. The Legislature finds and declares that the public health interest requires that there be uniform statewide health and sanitation standards for retail food facilities to assure the people of this state that food will be pure, safe, and unadulterated. It is the intention of the Legislature to occupy the whole field of health and sanitation standards for these food facilities, and the standards set forth in this chapter and regulations adopted pursuant to its provisions shall be exclusive of all local health and sanitation standards relating to these facilities.

27502. The State Department of Health Services shall adopt regulations to implement and administer the provisions of this chapter.

27503. Nothing in this chapter shall prohibit a local governing body from adopting an evaluation or grading system for food facilities, from adopting an employee health certification or employee training program, from prohibiting any type of food facility, or from regulating the provision of patron toilet and handwashing facilities.

27504. In all laws and regulations, references to Chapter 6 (commencing with Section 28190), Chapter 11 (commencing with Section 28520), and Chapter 14 (commencing with Section 28800), of Division 22 of the Health and Safety Code, or to the California Bakery Sanitation Law, the California Restaurant Act, and the Retail Food Production and Marketing Establishments Law, shall mean Chapter 4 (commencing with Section 27500) of Division 22 or the California Uniform Retail Food Facilities Law.

27505. Primary responsibility for enforcement of the provisions of this chapter shall be with local health agencies. Nothing in this chapter shall prevent the department from taking any necessary program or enforcement actions for the protection of the public health and safety.

Whenever the enforcement of the requirements of this chapter by any local enforcement agency is satisfactory to the department, the enforcement of the provision of this chapter shall not be duplicated by the department. The department may investigate to determine satisfactory enforcement of this chapter by a local enforcement agency.

27506. Any construction, alteration, remodeling, or installation of equipment in a food establishment pursuant to this chapter shall be in accordance with applicable building codes and shall be approved by the enforcement officer.

### Article 2. Definitions

27510. "Adulterated" means food which bears or contains any poisonous or deleterious substance which may render the food impure or injurious to health.

27511. "Approved" means acceptable to the department or health authority based on a determination of conformity with current public health principles, practices, and generally recognized industry standards.

27512. "Certified farmers' market" means a location certified by the county agricultural commissioner and operated as specified in Article 6.5 (commencing with Section 1392) of Title 3 of the California Administrative Code [*California Code of Regulations*].

27513. "Commissary" means a food establishment in which food, containers, equipment, or supplies are stored or handled for use in vehicles, mobile food preparation units, food carts, or vending machines.

27515. "Employee" means any person working in a food facility covered by this chapter.

27516. "Enforcement agency" means the State Department of Health Services and all local health agencies.

27517. "Enforcement officer" means the director, agents, or sanitarians appointed by the Director of Health Services, and all local health officers, directors of environmental health, and their duly authorized registered sanitarians and sanitarian trainees.

27518. "Equipment" means all cooking units, hoods, cutting blocks, processing machines, tables, refrigerators, sinks, dish machines, steam tables, and other items used in a food facility.

27519. "Food" means any raw or processed substance, ice, beverage, or ingredient intended to be used as food, drink, confection, or condiment for human consumption.

27520. "Food establishment" means any room, building, or place, or portion thereof, maintained, used, or operated for the purpose of storing, preparing, serving, manufacturing, packaging, transporting, salvaging, or otherwise handling food at the retail level. "Food establishment" includes a restricted food service transient occupancy establishment, as defined in Section 27535.5.

"Food establishment" does not include a commercial food processing establishment as defined in Section 28280.1, at the wholesale level, a vehicle, vending machine, satellite food distribution facility, temporary food facility, open-air barbecue, certified farmers' market, stationary mobile food preparation unit, or mobile food preparation unit.

27521. (a) "Food facility" means all of the following:

(1) Food establishment, vehicle, vending machine, produce stand, temporary food facility, satellite food distribution facility, stationary mobile food preparation unit, and mobile food preparation unit.

(2) Any place used in conjunction with the operations described in paragraph (1), including, but not limited to, storage facilities for food-related utensils, equipment, and materials.

(3) A certified farmers' market for purposes of permitting and enforcement.

(b) "Food facility" does not include any of the following:

(1) A cooperative arrangement wherein no permanent facilities are used for storing or handling food, or a private home, church, private club, or other nonprofit association which gives or sells food to its members and guests at occasional events, as defined in Section 27528.

(2) Premises set aside for wine tasting, as that term is used in Section 23356.1 of the Business and Professions Code and in the regulations adopted pursuant to that section, if no food or beverage is offered for sale for onsite consumption.

27522. "Food preparation" means packaging, processing, assembling, portioning, or any operation which changes the form, flavor, or consistency of food, but does not include trimming of produce.

27523. "Frozen food" means a food maintained at a temperature at which all moisture therein is in a solid state, not to exceed 0 degrees Celsius (32 degrees Fahrenheit).

27523.7 "Hearing Officer" means a local health officer, a director of environmental health, or his or her designee.

27524. "Hot dog" means a whole, cured, cooked sausage that is skinless or stuffed in a casing and which is also known as a frankfurter, frank, furter, wiener, red hot, vienna, bologna, garlic bologna, or knockwurst, and which may be served in a bun or roll.

27525. "Impound" means the legal control exercised by the enforcement officer over the use, sale, disposal, or removal of any food or equipment.

27526. "Mobile food preparation unit" means any vehicle or portable food service unit upon which food is prepared for service, sale, or distribution at retail. "Mobile food preparation unit" shall not include vehicles from which prepackaged food or approved unpackaged food is sold or offered for sale as prescribed by Article 11 (commencing with Section 27670).

27527. "Multiservice utensil" means a utensil manufactured and approved for use more than one time.

27528. "Occasional event" means an event which occurs not more than three days in any 90-day period.

27528.5. "Open-air barbecue facility" means an unenclosed facility for barbecuing food which is operated by a food establishment, stationary mobile food preparation unit, or temporary food facility.

27529. "Permit" means a written authorization to operate issued by a local enforcement officer.

27530. "Person" means any individual, firm, partnership, joint venture, association, corporation, estate, trust, receiver, syndicate, city, county, or other political subdivision, or any other group or combination acting as a unit.

27531. "Potentially hazardous food" means food capable of supporting rapid and progressive growth of microorganisms that may cause food infections or food intoxications. "Potentially hazardous food" does not include edible shell eggs, foods that have a pH level of 4.6 or below, a water activity (Aw) value of 0.85 or less under standard conditions, or food products in hermetically sealed containers processed to prevent spoilage.

27532. "Produce" means any fruit or vegetable in its raw or natural state.

27533. "Produce stand" means a food establishment which sells, offers for sale, or gives away only produce or shell eggs, or both.

27534. "Refrigeration unit" means a mechanical unit which extracts heat from an area through liquification and evaporation of a fluid by a compressor, flame, or thermoelectric device. "Refrigeration unit" also includes a cold plate permanently connected to a compressor or any other unit approved by the department.

27535. "Remodeled" means construction, building, or repair to the food facility that requires a permit from the local building authority.

27535.5 "Restricted food service transient occupancy establishment" means an establishment of 20 guestrooms or less, which provides overnight transient occupancy accommodations, which serves food only to its registered guests, which serves only a breakfast or similar early morning meal, and with respect to which the price of the food is included in the price of the overnight transient occupancy accommodation. For purposes of this section, "restricted food service transient occupancy establishment" refers to an establishment as to which the predominant relationship between the occupants thereof and the owner or operator of the establishment is that of innkeeper and guest. For purposes of this section, the existence of some other legal relationships as between some occupants and the owner or operator shall be immaterial.

27536. "Retail" means the storing, preparing, serving, manufacturing, packaging, transporting, salvaging,

or otherwise handling food for dispensing or sale directly to the consumer.

27536.5 "Satellite food distribution facility" means a location where only prepackaged, unit servings of food are distributed, which have been prepared or stored in an approved food facility operated by a school, governmental agency, or nonprofit organization.

27537. "Single service utensil" means a utensil which is manufactured and approved for use only once and which shall be discarded after use.

27537.5. "Stationary mobile food preparation unit" means a mobile food preparation unit which operates at a state, county, district, or citrus fair or any approved occasional event and which remains in a fixed position during food preparation and its hours of operation.

27538. "Temporary food facility" means a food facility operating out of temporary facilities approved by the enforcement officer at a fixed location for a period of time not to exceed 21 days in any 90-day period in conjunction with a single event or celebration.

27539. "Utensil" means any kitchenware, tableware, cutlery, glassware, container, implement, high chair tray, or other item with which food comes in contact during storage, transportation, display, preparation, serving, sale, or through use by an employee or consumer.

27540. "Vehicle" means any motorized or nonmotorized conveyance or portable food service unit upon which prepackaged food or approved unpackaged food is sold or offered for sale at retail. "Vehicle" does not include a mobile food preparation unit or a stationary mobile food preparation unit.

27541. "Vending machine" means any self-service device which, upon insertion of money or tokens, dispenses food without the necessity of replenishing the device between each vending operation. "Vending machine" does not include any such device dispensing exclusively peanuts, nuts, popcorn, ballgum, or hard candy; prepackaged candy, cookies, crackers, or similar snacks and beverages which are not potentially hazardous as defined in Section 27531, and prepackaged ice.

### Article 3. Plan Review and Permits

27550. A person proposing to build or remodel a food facility shall submit complete plans and specifications to the local enforcement agency for review and approval pursuant to the requirements of this chapter. The plans shall be approved or rejected within 20 working days after receipt by the local enforcement agency and the applicant shall be notified of the decision. Unless the plans are approved or rejected within 20 working days, they shall be deemed approved. The building department shall not issue a building permit for a food facility until after it has received plan approval by the local enforcement officer.

27551. A food facility shall not be open for business without a valid permit.

A permit shall be issued by the local enforcement agency when investigation has determined that the proposed facility and its method of operation will conform to the requirements of this chapter. A permit, once issued, is nontransferable. A permit shall be valid only for the person, location, type of food sales, or distribution activity approved and, unless suspended or revoked for cause, for the time period indicated.

Any fee for the permit and related services shall be determined by the local governing body. Fees shall be sufficient to cover the actual expenses of administering and enforcing this program. All moneys collected as fees shall be expended in carrying out the provisions of this chapter.

A permit shall be posted in a conspicuous place in the food facility or in the office of a vending machine business.

### Article 4. Enforcement and Inspection

27560. Enforcement officers are charged with the enforcement of this chapter and all regulations adopted pursuant to it.

An enforcement officer may enter, inspect, issue citations, and secure any sample, photographs, or other evidence from any facility, or any facility suspected of being a food facility, for the purpose of enforcing this chapter. A written report of the inspection shall be made and a copy shall be supplied or mailed to the owner, manager, or operator of the food facility.

27561. (a) Based upon inspection findings or other evidence, an enforcement officer may do any of the following:

(1) Impound any food which is found to be, or suspected of being, contaminated or adulterated.

(2) Impound equipment or utensils which are found to be unsanitary or in such disrepair that food, equipment, or utensils may become contaminated or adulterated. The enforcement officer may attach a tag to such food, equipment or utensils which shall be removed only by the enforcement officer following verification that the condition has been corrected.

(b) No food, equipment, or utensils impounded pursuant to subdivision (a) shall be used unless the impoundment has been released.

(c) Within 30 days the enforcement agency that has impounded the food, equipment, or utensils pursuant to subdivision (a) shall commence proceedings to release the impounded material or to seek administrative or legal remedy for its disposition.

27562. Any person who violates any provision of this chapter or regulation adopted pursuant to this chapter is guilty of a misdemeanor. Each offense shall be punished by a fine of not less than twenty-five dollars ($25) or more than one thousand dollars ($1,000) or by imprisonment in the county jail for a term not exceeding six months, or by both such fine and imprisonment.

27563. The owner, manager, or operator of any food facility is responsible for any violation by an employee of any provision of this chapter or any regulation adopted pursuant to this chapter. Each day the violation occurs shall be a separate and distinct offense.

27564. A violation of any provision of this chapter or regulation adopted pursuant to this chapter relating to facilities held in common or shared by more than one food facility shall be deemed a violation for which the owner, manager, or operator of each food facility is responsible.

**Article 5. Permit Suspension or Revocation**

27580. Any permit may be suspended or revoked by a local enforcement officer for a violation of this chapter. Any food facility for which the permit has been suspended shall close and remain closed until the permit has been reinstated. Any food facility for which the permit has been revoked shall close and remain closed until a new permit has been issued.

Whenever a local enforcement officer finds that a food facility is not in compliance with the requirements of this chapter, a written notice to comply shall be issued to the permittee. If the permittee fails to comply, the local enforcement officer shall issue to the permittee a notice setting forth the acts or omissions with which the permittee is charged, and informing him or her of a right to a hearing, if requested, to show cause why the permit should not be suspended or revoked. A written request for a hearing shall be made by the permittee within 15 calendar days after receipt of the notice. A failure to request a hearing within 15 calendar days after receipt of the notice shall be deemed a waiver of the right to a hearing. When circumstances warrant, the hearing officer may order a hearing at any reasonable time within this 15-day period to expedite the permit suspension or revocation process.

The hearing shall be held within 15 calendar days of the receipt of a request for a hearing. Upon written request of the permittee, the hearing officer may postpone any hearing date, if circumstances warrant such action.

27581. The hearing officer shall issue a written notice of decision to the permittee within five working days following the hearing. In the event of a suspension or revocation, the notice shall specify the acts or omissions with which the permittee is charged, and shall state the terms of the suspension or that the permit has been revoked.

27582. (a) If any immediate danger to the public health or safety is found, unless the danger is immediately corrected, an enforcement officer may temporarily suspend the permit and order the food facility immediately closed. Immediate danger to the public health and safety means any condition, based upon inspection findings or other evidence, that can cause food infection, food intoxication, disease transmission, or hazardous condition, including, but not limited to, unsafe food temperature, sewage contamination, nonpotable water supply, or an employee who is a carrier of a communicable disease.

(b) Whenever a permit is suspended as the result of an immediate danger to the public health or safety, the enforcement officer shall issue to the permittee a notice setting forth the acts or omissions with which the permittee is charged, specifying the pertinent code section, and informing the permittee of the right to a hearing.

(c) At any time within 15 calendar days after service of a notice pursuant to subdivision (b), the permittee may request in writing a hearing before a hearing officer to show cause why the permit suspension is not warranted. The hearing shall be held within 15 calendar days of the receipt of a request for a hearing. A failure to request a hearing within 15 calendar days shall be deemed a waiver of the right to such hearing.

27583. The enforcement agency may, after providing opportunity for a hearing, modify, suspend, or revoke a permit for serious or repeated violations of any of the requirements of this code or for interference in the performance of the duty of the enforcement officer.

27584. A permit may be reinstated or a new permit issued if the enforcement agency determines that conditions which prompted the suspension or revocation no longer exist.

**Article 6. General Sanitation Requirements**

27590. This article governs general sanitation requirements for food facilities as defined in this chapter.

27591. All food shall be manufactured, produced, prepared, compounded, packed, stored, transported, kept for sale, and served so as to be pure, free from contamination, adulteration, and spoilage; shall have been obtained from approved sources; shall otherwise be fully fit for human consumption; and shall conform to the applicable provisions of the Sherman Food, Drug, and Cosmetic Law (Division 21 (commencing with Section 26000)).

27591.5. Any food facility which serves or sells over the counter directly to the consumer an unlabeled or unpackaged food that is a confectionery which contains alcohol in excess of 1/2 of 1 percent by weight shall provide written notice to the consumer of that fact. The notice shall be prominently displayed or be provided in

some other manner, as determined by the department. The department shall adopt regulations to govern the notice required by this section in order to effectuate the purposes of this section.

### Article 7. Sanitation Requirements for Food Facilities

27600. This article governs sanitation requirements for food facilities as defined in this chapter.

27601. All potentially hazardous food shall be held at or below 7 degrees Celsius (45 degrees Fahrenheit) or shall be kept at or above 60 degrees Celsius (140 degrees Fahrenheit) at all times. A thermometer accurate to plus or minus 1 degree Celsius (2 degrees Fahrenheit) shall be provided for each refrigeration unit, shall be located to indicate the air temperature in the warmest part of the unit and, except for vending machines, shall be affixed to be readily visible. Containers of potentially hazardous food displayed for service may be placed in an ice bed or held by a similar means which maintains the food at or below 7 degrees Celsius (45 degrees Fahrenheit). Except for vending machines, an accurate easily readable metal probe thermometer suitable for measuring the temperature of food shall be readily available on the premises.

27602. Raw duck, which otherwise would be readily perishable, shall be exempt from the provisions of Section 27601 for a period not to exceed two hours, if the duck will subsequently be cooked at or above a temperature of 177 degrees Celsius (350 degrees Fahrenheit) for at least 60 minutes.

(a) Whole Chinese-style roast duck shall be exempt from Section 27601 for a period not to exceed four hours after the duck is prepared, since the methods used to prepare these foods inhibit the growth of microorganisms which can cause food infections or food intoxications.

Nothing in this section shall be construed to supersede any provision of this chapter except the provisions specified in this section.

(b) For the purpose of this section, "Chinese-style roast duck" shall include, but is not limited to, Chinese-style barbecue duck, dry hung duck, and Peking duck. Chinese-style roast duck means duck which is prepare as follows:

(1) The abdominal cavity is cleaned.

(2) The duck is marinated.

(3) The cavity is closed prior to cooking.

(4) The duck is roasted at a temperature of 177 degrees Celsius (350 degrees Fahrenheit) or more for at least 60 minutes.

27603. All food shall be prepared, stored, displayed, dispensed, placed, transported, sold, and served as to be protected from dirt, vermin, unnecessary handling, droplet contamination, overhead leakage, or other contamination.

27604. (a) No unpackaged food which has been served to any person or returned from any eating area shall be served again or used in the preparation of other food. No food prepared or stored in a private home shall be used, stored, served, offered for sale, sold, or given away in a food facility. A private home shall not be used for the purpose of giving away, selling, or handling food at retail, as defined in Section 27536.

(b) Except as provided in subdivision (c) of Section 27621, every bakery product shall have a protective wrapping which shall bear a label which complies with the labeling requirements prescribed by the Sherman Food, Drug, and Cosmetic Law (Division 21 (commencing with Section 26000)). Bakery products sold directly to a restaurant, catering service, retail bakery, or sold over the counter directly to the consumer by the manufacturer or bakery distributor shall be exempt from the provisions of this subdivision. French style, hearth-baked, or hard-crusted loaves and rolls shall be considered properly wrapped if contained in a open-end bag of sufficient size to enclose the loaves or rolls.

27605. All employees preparing, serving, or handling food or utensils shall wear clean, washable outer garments, or other clean uniforms, and shall keep their hands clean. All employees shall wash their hands and arms with cleanser and warm water before commencing work, immediately after using toilet facilities, and at other times as are necessary to prevent contamination of food. Legible signs shall be posted in each toilet room directing attention to this requirement. All employees shall wear hairnets, caps, or other suitable coverings to confine all hair when required to prevent the contamination of food or utensils. Employees serving food shall use tongs or other implements, rather than their hands. No employee shall expectorate or use tobacco in any form in any area where food is prepared, served, or stored or utensils are cleaned or stored. No employee shall commit any act which may result in contamination or adulteration of any food, food contact surface, or utensil. The employer shall post and maintain "No Smoking" signs in food preparation, food storage, utensil cleaning, and utensil storage areas.

When information as to the possibility of disease transmission is presented to an enforcement officer, he or she shall investigate conditions and take appropriate action. The enforcement officer may, after investigation and for reasonable cause, require any or all of the following measures to be taken:

(a) The immediate exclusion of any employee from the affected food facility.

(b) The immediate closing of the food facility until, in the opinion of the enforcement officer, no further danger of disease outbreak exists. Any appeal of the closure shall be made in writing within five days to the applicable enforcement agency.

(c) A medical examination of any employee, with any laboratory examination which may be indicated. Should a medical examination be refused by an employee, the enforcement officer may require the immediate exclusion of the refusing employee from that or any other food facility until an acceptable medical or laboratory examination shows that the employee is not affected with a disease in a communicable form.

27606. No insecticide, rodenticide, or other poisonous substance shall be stored in any food preparation area, except in a separate enclosure provided for that purpose. All poisonous substances, detergents, bleaches, cleaning compounds, or any other injurious or poisonous material shall be specifically and plainly labeled as to contents and hazardous use and shall be stored only in their original, labeled container. None of these products shall be used or stored in a manner which may cause contamination or adulteration of food, food contact surfaces, or utensils.

27607. A food facility shall at all times be so constructed, equipped, maintained, and operated as to prevent the entrance and harborage of animals, birds, and vermin, including, but not limited to, rodents and insects.

27608. Each food facility shall be provided with any facilities and equipment necessary to store or dispose of all waste material. All food waste and rubbish containing food waste shall be kept in leakproof and rodentproof containers and shall be contained so as to minimize odor and insect development by covering with close-fitting lids or placement in a disposable bag which is impervious to moisture and then sealed. Trash containers inside a food facility need not be covered during periods of operation. All food waste and rubbish shall be removed and disposed of in a sanitary manner as frequently as may be necessary to prevent the creation of a nuisance.

27609. The premises of each food facility shall be kept clean and free of litter, rubbish, and vermin.

27610. (a) Except as otherwise provided in subdivision (b), no live animal, bird, or fowl shall be kept or allowed in any food facility.

(b) Subdivision (a) shall not apply to dogs being used by the blind, signal dogs, service dogs, such dogs in training under proper supervision, or to dogs under the control of uniformed law enforcement officers or of uniformed employees of a private patrol service who are licensed pursuant to Chapter 11 (commencing with Section 7500) of Division 3 of the Business and Professions Code, while these employees are acting within the course and scope of their employment as private patrolmen. All such dogs shall be excluded from food preparation and utensil wash areas. Aquariums and aviaries shall be allowed if enclosed so as not to create a public health problem.

27611. All food facilities and all equipment, utensils, and facilities shall be kept clean, fully operative, and in good repair.

27612. Frozen food shall be kept frozen except as provided in Section 27622.

27613. (a) Manual sanitization shall be accomplished in the final sanitizing rinse by one of the following:

(1) Contact with a solution of 100 ppm available chlorine solution for 30 seconds.

(2) Contact with a solution of 25 ppm available iodine for one minute.

(3) Contact with a solution of 200 ppm quaternary ammonium for one minute.

(4) Contact with water of at least 82 degrees Celsius (180 degrees Fahrenheit) for 30 seconds.

(b) In-place sanitizing shall be as described in paragraph (1), (2), (3), or (4) or subdivision (a).

(c) Other methods may be used if approved by the department.

(d) Testing equipment and materials shall be provided to adequately measure the applicable sanitation method.

27614. All new and replacement equipment shall meet or be equivalent to applicable National Sanitation Foundation (NSF) standards or, in the absence of applicable NSF standards, be approved by the enforcement officer.

27615. Sulfites shall not be added to potentially hazardous foods.

### Article 8. Sanitation Requirements for Food Establishments

27620. This article governs sanitation requirements for food establishments, as defined in this chapter.

27621. (a) Adequate and suitable space shall be provided for the storage of food. Except for large or bulky food containers, all food shall be stored at least 15 centimeters (6 inches) off the floor or under other conditions which are approved. Containers may be stored on dollies, racks, or pallets not meeting this height requirement, if these items are easily movable. All cartons, boxes, or other materials used in the packaging of any food shall be protected at all times from dirt, vermin, and other forms of contamination or adulteration. All returned or damaged food products and food products from which the label has been removed shall be separated and stored in a separate area and in a manner which will prevent adulteration of other foods and shall not contribute to a vermin problem. Bulk food not stored in original packaging shall be stored in containers identifying the food by common name.

(b) Unpackaged food may be displayed in bulk for customer self-service under the following conditions:

(1) Produce and food requiring further processing may be displayed on open counters or in containers.

(2) Salad bars, buffet-type food service, and other ready-to-eat food shall:

(A) Be shielded so as to intercept a direct line between the customer's mouth and the food being displayed, or shall be in a container which has a tight-fitting, securely attached lid, or may be dispensed from approved mechanical dispensers.

(B) Be stored so as to be protected from vermin or other contamination.

(C) When displayed in a self-service container, shall be provided with a utensil with a handle for dispensing the product.

(3) Except for salad bar and buffet-type food service, a label is conspicuously displayed in plain view of the customer and securely attached to each self-service container, or in clear relationship thereto, which contains all of the following:

(A) The common name of the product.

(B) A declaration of the ingredients used by their common or usual name in descending order of predominance by weight. The declaration shall be provided in writing to the food establishment by the manufacturer, packer, or distributor.

*(4) Nonfood items shall be displayed and stored in an area separate from food.

(c) Unpackaged food may be displayed and sold in bulk in other than self-service containers if both of the following conditions are satisfied:

(1) The food is served by an employee of the food establishment directly to a consumer.

(2) The food is displayed in clean, sanitary, and covered or otherwise protected containers.

(d) If the director makes a specific finding that a disease is actually transmitted by the method of dispensing unpackaged foods, as prescribed by this section, the director may establish by regulation greater restrictions on the sale of that food than are required by this section. These regulations shall bear directly on the specific relationship between the disease actually transmitted and the dispensing methods permitted by this section.

27622. (a) All frozen food shall be kept at a temperature which will keep the food in the frozen state until ready for processing or preparation. No food which has been thawed shall be refrozen unless it has been cooked or processed.

(b) Potentially hazardous frozen foods shall be thawed only:

(1) In refrigeration units.

(2) Under potable running water of sufficient velocity to flush loose food particles into the sink drain.

(3) In a microwave oven.

(4) As part of the cooking process.

27623. (a) All utensils and equipment shall be scrapped, cleaned, or sanitized as circumstances require.

(b) All food establishments in which food is prepared or in which multiservice kitchen utensils are used shall have at least a two-compartment metal sink with two integral metal drainboards. Additional drainage space may be provided which is not necessarily attached to the sink. The sink compartments and drainage facilities shall be large enough to accommodate the largest utensil or piece of equipment to be cleaned therein. A one-compartment sink which is in use on January 1, 1985, may be continued in use until replaced.

(c) All food establishments in which multiservice consumer utensils are used shall clean the utensils in one of the following ways:

(1) Handwashing of utensils using a three-compartment metal sink with dual integral metal drainboards where the utensils are first washed by hot water and a cleanser until they are clean, then rinsed in clear, hot water before being immersed in a final warm solution meeting the requirements of Section 27613.

(2) Machine washing of utensils in machines using a hot water or chemical sanitizing rinse shall conform to National Sanitation Foundation (NSF) standards and shall be installed and operated in accordance with those standards. The machines shall be of a type and shall be installed and operated as approved by the department. The velocity, quantity, and distribution of the washwater, type and concentration of detergent used therein, and the time the utensils are exposed to the water shall be sufficient to clean the utensils. The quantity and pressure of rinse water and the time of exposure shall provide bactericidal effectiveness equivalent to that provided by compliance with NSF standards, or more restrictive standards if approved by the department. All new spray-type dish machines designed for hot water sanitizing shall be equipped with a self-sealing temperature and pressure test plug. The test plug shall be located immediately upstream of the rinse manifold in a horizontal position and on the machine exterior.

(3) A two-compartment metal sink, having metal drainboards, equipped for hot water sanitization, which is in use on January 1, 1985, may be continued in use until replaced.

(4) Other methods may be used after approval by the department.

(d) Hot and cold water under pressure shall be provided through a mixing valve to each sink compartment

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*Chaptered version, *Health and Safety Code* reads "(3)."

in all food establishments constructed on or after January 1, 1985.

(e) All utensil washing equipment, except undercounter dish machines, shall be provided with two integral metal drainboards of adequate size and construction. One drainboard shall be attached at the point of entry for soiled items and one shall be attached at the point of exit for cleaned and sanitized items. Where an undercounter dish machine is used, there shall be two metal drainboards, one for soiled utensils and one for clean utensils, located adjacent to the machine. The drainboards shall be sloped and drained to an approved waste receptor. This requirement may be satisfied by using the drainboards appurtenant to sinks as required in subdivision (b) and paragraph (1) of subdivision (c), if the facilities are located adjacent to the machine.

(f) The handling of cleaned and soiled utensils, equipment, and kitchenware shall be undertaken in a manner which will preclude possible contamination of cleaned items with soiled items.

(g) All utensils, display cases, windows, counters, shelves, tables, refrigeration units, sinks, dishwashing machines, and other equipment or utensils used in the preparation, sale, service, and display of food shall be made of nontoxic, noncorrosive materials, shall be constructed, installed, and maintained to be easily cleaned, and shall be kept clean and in good repair.

(h) Utensils and equipment shall be handled and stored so as to be protected from contamination. Single-service utensils shall be obtained only in sanitary containers or approved sanitary dispensers, stored in a clean, dry place until used, handled in a sanitary manner, and used once only.

27624. An adequate, protected, pressurized, potable supply of hot water, at least 49 degrees Celsius (120 degrees Fahrenheit), and cold water shall be provided. The water supply shall be from a water system approved by the health officer or the state department. Any hose used for conveying potable water shall be constructed of nontoxic materials, shall be used for no other purpose, and shall be clearly labeled as to its use. The hose shall be stored and used so as to be kept free of contamination. The potable water supply shall be protected with a back flow or back siphonage protection device, as required by applicable plumbing codes.

27625. All plumbing and plumbing fixtures shall be installed in compliance with local plumbing ordinances, shall be maintained so as to prevent any contamination, and shall be kept clean, fully operative, and in good repair.

All liquid wastes shall be disposed of through the plumbing system which shall discharge into the public sewerage or into an approved private sewage disposal system.

All steam tables, ice machines and bins, food preparation sinks, display cases, and other similar equipment which discharge liquid waste shall have this waste conveyed by a closed system, such as by a tube or rigid pipe, to an approved sewer line and disposed therein by an indirect connection. Drainage from refrigeration units shall be conducted in a sanitary manner to a floor sink or other approved device by an indirect connection or to a properly installed and functioning evaporator. Indirect waste receptors shall be located to be readily accessible for inspection and cleaning. Dishwashing machines may be connected directly to the sewer immediately downstream from a floor drain or they may be drained through an approved indirect connection.

27626. In each food establishment, there shall be provided clean toilet facilities in good repair for use by employees. The number of toilet facilities required shall be in accordance with local building and plumbing ordinances. Toilet facilities whose construction begins on or after January 1, 1985, and which are provided for use by patrons, shall be so situated that patrons do not pass through food preparation, food storage, or utensil washing areas. Toilet rooms shall be separated from other portions of the food establishment by well-fitting, self-closing doors or by other methods approved by the enforcement officer. Toilet rooms shall not be used for the storage of food, equipment, or supplies. Toilet tissue shall be provided in a permanently installed dispenser at each toilet.

27626.1. Amusement parks, stadiums, arenas, retail shopping centers, and similar premises, which include food facilities and toilet facilities within their boundaries, shall not be required to provide toilet facilities for employee use within each food establishment, as specified by Section 27626, if approved toilet facilities are located within 300 feet [91 meters] of each food establishment and are readily available for use by employees. Food establishments subject to this section shall be provided with handwashing facilities for employee use, as required by Section 27627.

27627. Handwashing facilities shall be provided within or adjacent to toilet rooms and shall be equipped with an adequate supply of hot and cold running water under pressure. Facilities constructed on or after January 1, 1985, shall have such water provided from a combination faucet, or water from a premixing faucet which supplies warm water for a minimum of 10 seconds while both hands are free for washing. The number of handwashing facilities required shall be in accordance with local building and plumbing ordinances. Handwashing cleanser and single-use sanitary towels or hot-air blowers shall be provided in dispensers at, or adjacent to, handwashing facilities. Food establishments beginning construction or extensive remodeling on or after January 1, 1985, shall provide facilities exclusively for handwashing within, or adjacent to, each kitchen.

27627.3. Clean toilet facilities, in good repair, shall be provided for patrons, guests, or invitees on property used in connection with, or in, each food establishment with more than 20,000 square feet [1,840 square meters] of floor space.

For the purposes of this section, the gas pump area of a service station which is maintained in conjunction with a food establishment shall not be considered as property used in connection with the food establishment or be considered in determining the square footage of floor space of the food establishment.

There shall be at least one separate toilet facility for men and one separate toilet facility for women. Toilet rooms shall be separated by well-fitted, self-closing doors that prevent passage of flies, dust, or odors.

Handwashing facilities, in good repair, shall be provided for patrons, guests, or invitees within or adjacent to toilet rooms and shall be equipped with hot and cold running water. Handwashing detergent or soap and sanitary towels or hot-air blowers shall be provided at handwashing facilities in permanently installed dispensing devices. Notwithstanding any other provision of law, other than Section 27627.5, a violation of this section shall be an infraction.

27627.5. The requirements of Section 27627.3 for restroom facilities which are accessible to patrons, guests, or invitees on the property may be satisfied by permitting access by those persons to the toilet and handwashing facilities which are required by other provisions of this chapter.

However, if the requirements of Section 27627.3 are satisfied by permitting access by those persons to the toilet and handwashing facilities which are required by other provisions of this chapter, a violation of these provisions shall be a misdemeanor punishable pursuant to Section 27562.

27627.7. Sections 27627.3 and 27627.5 apply only to food establishments as to which construction is commenced on or after July 1, 1984.

27628. A room, enclosure, or designated area, separated from toilets, food storage, food preparation areas, and utensil washing areas, shall be provided where employees may change and store clothes. No employee shall store clothing or personal effects in any other area on the premises.

27629. Ventilation shall be provided to remove gases, odors, steam, heat, grease, vapors, or smoke from the food establishment.

All areas shall have sufficient ventilation to facilitate proper food storage and to provide a reasonable condition of comfort for any employee, consistent with the job performed by the employee. On or after January 1, 1985, there shall be provided mechanical exhaust ventilation at or above all newly installed cooking equipment as required in Article 10.4 (commencing with Section 13670) of Title 17 of, and Chapter 4–20 (commencing with Section 4–2000) of Part 4 of Title 24 of the California Administrative Code [*California Code of Regulations*].

The provisions of this section shall not apply to cooking equipment when such equipment has been submitted to the department for evaluation, and it has found that the equipment does not produce toxic gases, smoke, grease, vapors, and heat when operated under conditions recommended by the manufacturer.

Toilet rooms shall be vented to the outside air by means of an openable screened window, an air shaft, or a light-switch-activated exhaust fan, consistent with the requirements of local building codes.

27630. Each food establishment, except produce stands, shall be fully enclosed in a building consisting of floors, walls, and overhead structure which meet the minimum standards prescribed by this chapter. Food establishments which are not fully enclosed on all sides and which are in operation on January 1, 1985, shall not be required to meet the requirement for a fully enclosed structure pursuant to this section. This section shall not be construed to require the enclosure of dining areas or open-air barbecue facilities.

27631. (a) Except in sales areas of retail food establishments and as otherwise provided in subdivision (d), the floor surfaces in all areas in which food is prepared, packaged, or stored, where any utensil is washed, where refuse or garbage is stored, where janitorial facilities are located, and, except with respect to areas relating to guestroom accommodations and the private accommodations of owners and operators in restricted food service transient occupancy establishments, as defined in Section 27535.5, in all toilet and handwashing areas, and in employee change and storage areas shall be smooth and of durable construction and nonabsorbent materials which are easily cleaned.

These floor surfaces shall be coved at the juncture of the floor and wall with a 10 millimeter (3/8 inch) minimum radius coving and shall extended up the wall at least 10 centimeters (4 inches) except in areas where food is stored only in unopened bottles, cans, cartons, sacks, or other original shipping containers.

(b) Upon new construction or extensive remodeling on or after January 1, 1985, floor drains shall be installed as follows:

(1) In floors that are water-flushed for cleaning.

(2) In areas where pressure spray methods for cleaning equipment are used. Floor surfaces in areas pursuant to this subdivision shall be sloped 1:50 to the floor drains.

(c) Upon new construction or extensive remodeling on or after January 1, 1985, floor sinks, funnel drains, or equivalent devices shall be installed to receive discharges of water or other fluid waste from equipment.

(d) Except for dining and serving areas, the use of sawdust, wood shavings, peanut hulls, or similar materials is prohibited.

(e) This section shall not prohibit the use of approved dust-arresting floor sweeping and cleaning compounds during floor cleaning operations or the use of approved anti-slip floor finishes or materials in areas where necessary for safety reasons.

(f) Food establishments which are in operation on January 1, 1985, and in which sawdust is used as an absorbent in meat holding units may continue this use until the floor is replaced.

27632. The walls and ceilings of all rooms, except for bar areas, rooms where food is stored in unopened containers, and dining areas, shall be of a durable, smooth, and nonabsorbent, washable surface. Walls and ceilings of food preparation and utensil washing areas and interior surfaces of walk-in refrigeration units shall also be light-colored. Wall areas adjacent to bar sinks shall be smooth, nonabsorbent, and washable surface. Acoustical paneling may be utilized providing it is installed not less than 1.8 meters (6 feet) above the floor. Any perforations shall not penetrate the entire depth of the panel, shall not be greater than 3 millimeters (1/8 inch) in any dimension, and shall not comprise more than 25 percent of the exposed panel surface. The paneling shall otherwise meet the requirements of this section.

Conduits of all types shall be installed within walls as practicable. When otherwise installed, they shall be mounted or enclosed so as to facilitate cleaning.

27633. Adequate and suitable space shall be provided for storage of clean linens, including apparel, towels, and cleaning cloths.

Soiled linens, apparel, towels, tablecloths, and cleaning cloths shall be kept in cleanable containers provided only for this purpose and shall not be reused until they have been laundered.

27634. (a) A room, area, or cabinet separated from any food preparation or storage area, or utensil washing or storage area, shall be provided for the storage of cleaning equipment and supplies, such as mops, buckets, brooms, cleansers, and waxes.

(b) Any food establishment constructed or extensively remodeled on or after January 1, 1985, shall be equipped with at least one of the following to be used exclusively for general cleaning purposes and for the disposal of mop bucket wastes and other liquid wastes:

(1) A one-compartment, nonporous janitorial sink.

(2) A slab, basin, or floor constructed of concrete or equivalent material, curbed and sloped to a drain. Such facilities shall be connected to approved sewerage and provided with hot and cold running water through a mixing valve and protected with a backflow protection device.

27635. In every room and area in which any food is prepared, manufactured, processed, or packaged, or in which utensils are cleaned, sufficient natural or artificial lighting shall be provided to produce an intensity of not less than 215 lux (20 footcandles) as measured 76 centimeters (30 inches) above the floor, except that the working surfaces on which alcoholic beverages are prepared or where utensils used in the preparation or service of alcoholic beverages are cleaned, shall be provided with at least 108 lux (10 footcandles) of light. Food and utensil storage rooms, refrigeration storage, and toilet and dressing rooms shall be provided with at least 108 lux (10 footcandles) of light. Light fixtures in areas where food is prepared or where open food is stored or where utensils are cleaned shall be of shatterproof construction or shall be protected with shatterproof shields and shall be readily cleanable.

During general cleanup activities, at least 215 lux (20 footcandles) of light, measured 76 centimeters (30 inches) above the floor, shall be provided in the area being cleaned, including, but not limited to, areas where alcoholic beverages are prepared or served.

27636. No sleeping accommodations shall be maintained or kept in any room where food is prepared, stored, or sold. All living and sleeping quarters shall be separated from the food establishment. No door or other opening shall be permitted in the partition which separates the food establishment from the living or sleeping quarters.

27637. (a) The department shall adopt and approve first aid instructions designed and intended for use in removing food which may become stuck in a person's throat. These instructions shall be limited to first aid techniques not involving the use of any physical instrument or device inserted into the victim's mouth or throat.

(b) The department shall supply to the proprietor of every on-site eating establishment adopted and approved instructions pursuant to subdivision (a). The proprietor shall post the instructions in a conspicuous place or places, which may include an employee notice board, in order that the instructions may be consulted by anyone attempting to provide relief to a victim in a choking emergency.

(c) In the absence of other evidence of noncompliance with this section, the fact that the instructions were not posted as required by this section at the time of a choking emergency shall not in and of itself subject the proprietor or his or her employees or independent contractors to liability in any civil action for damages for personal injuries or wrongful death arising from a choking emergency.

(d) Nothing in this section shall impose any obligation on any person to remove, assist in removing, or attempt to remove food which has become stuck in another person's throat. In any action for damages for personal injuries or wrongful death, neither the proprietor no any person who removes, assists in removing, or attempts to remove such food in accordance with instructions adopted by the department shall be liable for any civil damages as a result of any acts or omissions by such person in rendering emergency assistance.

**Article 9. Open-Air Barbecue Facilities**

27640. This article governs sanitation requirements for open-air barbecue facilities as defined in this chapter.

27641. Notwithstanding the provisions of this chapter, neither the state department nor any city, county, or city and county shall require the enclosure of an open-air barbecue facility if the appropriate enforcement officer determines that the barbecue facility meets all of the following requirements:

(a) The facility is operated on the same premises as, in reasonable proximity to, and in conjunction with, a food establishment, temporary food facility, or stationary mobile food preparation unit.

(b) All food waste and rubbish containing food waste is handled in accordance with the requirements of Section 27608.

(c) The facility is operated in compliance with the provisions of Articles 6 (commencing with Section 27590) and 7 (commencing with Section 27600), except for Sections 27607, 27610, and 27613.

(d) The multiservice utensils and equipment used in conjunction with the open-air barbecue facility are made of nontoxic materials, are constructed and maintained in a manner so they can be easily cleaned, and are kept clean and in good repair.

(e) Food and beverages served out of doors are dispensed from units approved by the enforcement officer. No other food may be prepared or stored in the out of doors, except for food cooked on the open-air barbecue unit.

(f) (1) Except as otherwise provided in paragraph (2), no live animals, birds, or fowl shall be kept or allowed in an area within 20 feet of any area where food or beverage is prepared, stored, kept, or served.

(2) Paragraph (1) does not prohibit the presence, in any area where food is served to the public, guests, or patrons, of a guide dog, signal dog, or service dog, as defined by Section 54.1 of the Civil Code, accompanied by a totally or partially blind person, deaf person, person whose hearing is impaired, or handicapped person, or dogs accompanied by persons licensed to train guide dogs for the blind pursuant to Chapter 9.5 (commencing with Section 7200) of Division 3 of the Business and Professions Code.

(3) Paragraph (1) does not apply to dogs under the control of uniformed law enforcement officers or of uniformed employees of private patrol operators and operators of a private patrol service who are licensed pursuant to Chapter 11.5 (commencing with Section 7512) of Division 3 of the Business and Professions Code, while those employees are acting within the course and scope of their employment as private patrol persons.

(4) Those persons and operators described in paragraphs (2) and (3) are liable for any damage done to the premises or facilities by the dog.

(g) If the barbecue facility is a permanent structure, it is equipped with an impervious and easily cleaned floor surface that extends a minimum of five feet [1.5 meters] from the open-air barbecue facility on all open sides.

(h) The barbecue facility is located in an area reasonably protected from dust, as determined by the enforcement officer.

(i) The barbecue facility is not operated in, or out of, any motor vehicle or in any area or location that may constitute a fire hazard, as determined by the enforcement officer. For the purpose of this section, a motor vehicle does not include a stationary mobile food preparation unit, as defined in Section 27537.5.

(j) Sanitary facilities, including, but not limited to, toilet facilities and handwashing facilities shall be available for use within 200 feet [61 meters] of the barbecue facility and shall comply with all provisions of this chapter. Sanitary facilities that do not meet the requirements of this chapter shall not be located closer to the barbecue facility than the sanitary facilities required to be provided by this section.

27642. No air pollution control district or air quality management district shall require the enclosure of an open-air barbecue facility if the appropriate enforcement officer determines that the barbecue facility meets all requirements prescribed by Section 27641.

**Article 10. Vending Machines**

27650. This article governs sanitation requirements for vending machines as defined in this chapter.

27651. Each vending machine or machine location shall have posted in a prominent place a sign indicating the owner's name, address, and telephone number.

27652. All food shall be stored and packaged in clean, protected containers, and handled, transported, and vended in a sanitary manner. Wet storage of packaged products is prohibited.

Potentially hazardous food shall be dispensed to the consumer in the original package into which it was placed at the commissary or processing plant. Bulk potentially hazardous food is prohibited.

27653. All food contact surfaces shall be cleaned and sanitized either in place in a machine so designed and approved or by removing from the machine and cleaning and sanitizing at an approved facility.

All food contact surfaces when removed from the machine after cleaning and sanitizing shall be protected from contamination before being returned to the machine.

A record of cleaning and sanitizing shall be maintained by the operator in each machine and shall be current for at least the past 30 days.

27654. Single-service containers which are used in machines dispensing products in bulk, shall be obtained in sanitary packages, shall be stored in a clean, dry place until used, and shall be handled in a sanitary manner. The containers shall be stored in the original package until introduced into the container magazine or dispenser of the vending machine. The containers stored within the vending machine shall be protected from manual contact, dirt, vermin, and other contamination.

27655. Each vending machine shall be located in a room, area, or space which shall minimize the potential for contamination of food. The floor area upon which vending machines are located shall be smooth, of cleanable construction, and capable of withstanding repeated washing and scrubbing.

27656. Water used in vending machines shall be potable.

27657. While in transit to machine locations, food, single-service containers, and equipment shall be protected from dirt, vermin, and other contamination.

27658. On or after January 1, 1985, all vending machines shall be constructed in accordance with National Sanitation Foundation or National Automatic Merchandising Association standards, or the equivalent thereof.

27659. Vending machines shall meet all the requirements of Article 6 (commencing with Section 27590) and applicable sections of Article 7 (commencing with Section 27600).

### Article 11. Vehicles

27670. This article governs sanitation requirements for vehicles as defined in this chapter.

27671. The name, address, and telephone number of the owner, operator, permittee, business name, or commissary shall be clearly and permanently indicated on both sides of a vehicle exterior. The name shall be in letters at least 8 centimeters (3 inches) high and shall have strokes at least 1 centimeter (3/8 inch) wide, and shall be of a color contrasting with the vehicle exterior. Letters for address and telephone number shall not be less than 2.5 centimeters (1 inch) high.

27672. (a) Equipment on a vehicle, including the interior of cabinet units or compartments, shall be equipped so as to have smooth, easily accessible, and easily cleanable surfaces. Unfinished wooden surfaces are not permitted. Construction joints shall be tightly fitted and sealed so as to be readily cleanable. Equipment, including utensils, shall be constructed of nontoxic materials and shall be readily cleanable.

(b) All food displayed, sold, or offered for sale from vehicles shall be prepackaged at a facility approved by the enforcement agency except as provided in Sections 27673 and 27675.

(c) During operation, no food shall be stored, displayed, or served from any place other than the vehicle.

(d) Food condiments shall be protected from contamination and, where available for self-service, shall be prepackaged or available only from approved dispensing devices.

(e) During transportation and storage, food and food contact surfaces shall be protected from contamination.

(f) All vehicles shall operate out of a commissary or other facility approved by the enforcement agency. Vehicles shall report to the commissary at least once each operating day for cleaning and servicing operations. In addition, vehicles whereon nonprepackaged hot dogs are handled shall be properly stored at a commissary or other facility approved by the enforcement agency so as to be protected from unclean or unsanitary conditions.

(g) Food products remaining after each day's operation shall be stored only in an approved food facility.

(h) Utensils and equipment shall be handled and stored so as to be protected from contamination. Single-service utensils shall be obtained only in sanitary containers or approved sanitary dispensers, stored in a clean, dry place until used, handled in a sanitary manner, and used once only.

(i) All waste water shall be drained to an approved water receptor.

(j) Potentially hazardous foods shall be maintained at or below 7 degrees Celsius (45 degrees Fahrenheit) or at or above 60 degrees Celsius (140 degrees Fahrenheit) at all times.

(k) Vehicular food sales shall be conducted within 60 meters (200 feet) of approved and readily available toilet and handwashing facilities or as otherwise approved by the enforcement officer to ensure proper sanitary facilities are available to the vehicle employee.

27673. (a) The following foods may be sold from vehicles in an unpackaged state, provided the storage, display, and dispensing methods are approved by the enforcement agency:

(1) Popcorn.

(2) Nuts.

(3) Produce.

(4) Pretzels and similar bakery products.

(5) Candy.

(6) Hot dogs.

(7) Snowcones.

(8) Whole fish and whole aquatic invertebrates.

(b) Hot and cold beverages which are not potentially hazardous, as defined in Section 27531, may be sold from approved bulk dispensing units.

(c) Vehicles selling or offering for sale nonprepackaged foods, as specified in subdivision (a), except produce and approved beverages, shall be equipped with a food compartment as specified in subdivision (a) of Section 27675. In addition, those vehicles handling nonprepackaged hot dogs, popcorn, or snowcones shall comply with subdivisions (b), (c), (d) and (e) of Section 27675. Those vehicles handling unpackaged whole fish and aquatic invertebrates shall comply with subdivision (c) of Section 27675 for drainage of waste water from display and storage compartments.

27674. All potentially hazardous food shall be prepackaged in an approved facility except as provided in Section 27675. A tamale shall be considered prepackaged if dispensed to the customer in its original, inedible wrapper.

27675. Vehicles on which nonprepackaged hot dogs, popcorn, or snowcones are sold or offered for sale shall, in addition to the requirements of Section 27672, be constructed and equipped as follows:

(a) The food compartment shall be completely closed. The opening to the food compartment shall be sufficiently large to permit food assembly and service operations and shall be provided with a tightly fitted closure which, when closed, protects interior surfaces from dust, debris, and vermin. All food compartments and food contact surfaces shall be constructed so as to be smooth, easily accessible, and easily cleanable.

(b) A one-compartment metal sink furnished with warm running water which is at least 38 degrees Celsius (101 degrees Fahrenheit) and cold water. The sink shall be of a size suitable for washing hands and utensils.

(c) Handwashing cleanser and single-service towels.

(d) A water supply tank of at least 18 liters (5 gallons) capacity.

(e) A waste water tank of at least 28 liters (7.5 gallons) capacity.

27676. Vehicles on which nonprepackaged hot dogs, popcorn, or snowcones are sold or offered for sale that operate exclusively on premises wherein approved toilet, handwashing, and utensil washing facilities are readily available and within 60 meters (200 feet) shall be exempt from the requirements of subdivisions (b) through (e) of Section 27675.

Vehicles subject to this section which were in operation as of July 1, 1986, shall not be required to meet the requirements of this article relating to utensil washing facilities, as long as an approved reserve supply of utensils is maintained on the vehicle.

### Article 12. Mobile Food Preparation Units, Stationary Mobile Food Preparation Units, and Commissaries

27790. This article governs sanitation requirements for mobile food preparation units, stationary mobile food preparation units, and commissaries as defined in this chapter.

27791. (a) All mobile food preparation units, stationary mobile food preparation units, and commissaries shall meet the applicable requirements in Article 6 (commencing with Section 27590), Article 7 (commencing with Section 27600), and Article 8 (commencing with Section 27620), unless specifically exempted from any of these provisions as provided in this article, and shall meet the provisions of Article 10 (commencing with Section 13600) of, and Article 10.1 (commencing with Section T17-13611) of Subchapter 2 of Chapter 5 of Part 1 of Title 17 of the California Administrative Code [*California Code of Regulations*]. Mobile food preparation units and stationary mobile food preparation units shall be exempt from the requirements of Section 27626 and 27628, and subdivision (b) of Section 27634.

(b) Each stationary mobile food preparation unit shall be certified pursuant to Article 10 (commencing with Section 13600) of Subchapter 2 of Chapter 5 of Part 1 of Title 17 of the California Administrative Code [*California Code of Regulations*] before commencing operation each calendar year. The local enforcement agency shall address all applicable construction standards and submit proof of certification to the state department. Construction recertification within a calendar year shall not be required except in either of the following instances:

(1) Where structural modifications are made.

(2) Where otherwise required by the state department. The state department may issue an annual certificate of compliance for each certified vehicle, as required by regulation.

27792. All mobile food preparation units shall operate out of a commissary or other facility approved by the enforcement agency. Mobile food preparation units

shall report to the commissary at least once each operating day for cleaning and servicing operations, except as otherwise approved by the enforcement officer.

### Article 13. Temporary Food Facilities

27800. This article governs sanitation requirements for temporary food facilities as defined in this chapter.

27801. (a) Floors shall be smooth and cleanable. The use of sawdust or similar materials is prohibited.

(b) Walls and ceilings shall be constructed of either wood, canvas, plastic, or similar material and fine mesh fly screening and shall completely enclose the facility. Facilities wherein all food and beverage is prepackaged at a facility approved by the local enforcement officer shall not be required to be fully enclosed with fly screening. Food service openings shall be equipped with tightfitting closures to minimize the entrance of insects.

(c) Except where all food and beverage is prepackaged, handwashing and utensil washing facilities approved by the enforcement officer shall be provided within temporary food facilities.

(d) Facilities for the sanitary disposal of all liquid waste shall be subject to the approval of the enforcement officer.

(e) At least one toilet facility for each 15 employees shall be provided within 60 meters (200 feet) of each temporary food facility.

(f) Food contact surfaces shall be smooth, easily cleanable, and nonabsorbent.

27802. (a) All food shall be prepared in a food establishment or on the premises of a temporary food facility. No food or beverage stored or prepared in a private home may be offered for sale, sold, or given away from a temporary food facility.

(b) All food and beverage shall be protected at all time from unnecessary handling and shall be stored, displayed and served so as to be protected from contamination.

(c) Potentially hazardous food and beverage shall be maintained at or below 7 degrees Celsius (45 degrees Fahrenheit) or at or above 60 degrees Celsius (140 degrees Fahrenheit) at all times.

(d) Ice used in beverages shall be protected from contamination and shall be maintained separate from ice used for refrigeration purposes.

(e) All food and food containers shall be stored off the floor on shelving or pallets located within the facility.

(f) Smoking is prohibited in temporary food facilities.

(g) Live animals, birds, or fowl are not permitted in temporary food facilities.

(h) All garbage shall be disposed of in a manner approved by the enforcement officer.

(i) Employees preparing or handling food shall wear clean clothing and shall keep their hands clean at all times.

27803. The enforcement officer may establish additional structural or operational requirements as necessary to ensure that food is of a safe and sanitary quality.

27804. Open-air barbecue facilities may be operated adjacent to temporary food facilities with the approval of the enforcement officer and subject to the requirements of Article 9 (commencing with Section 27640).

### Article 14. Produce Stands

27820. This article governs sanitation requirements for produce stands as defined in this chapter.

27821. (a) Produce stands operated by a producer selling or offering for sale produce or shell eggs, or both, are exempt from the provisions of this chapter, provided the produce stand is operated on premises controlled by the producer.

(b) For purposes of this section, "producer" means a person or entity that produces shell eggs, fruits, nuts, or vegetables by practice of the agricultural arts upon land which the person or entity controls.

(c) All other produce stands shall meet the requirements of Articles 6 (commencing with Section 27590), 7 (commencing with Section 27600), and 8 (commencing with Section 27620), except for the following:

(1) All food shall be stored at least 46 centimeters (18 inches) off the floor, except that food stored in a walk-in refrigeration unit shall be stored at least 13 centimeters (5 inches) off the floor.

(2) Food preparation is prohibited.

(3) Foods, other than trimmed produce and shell eggs, shall not be kept at these food establishments. This shall not apply to retail dairy processing rooms.

(d) A produce stand shall have no more than one side open to the outside air during business hours.

### Article 15. Certified Farmers' Markets

27830. This article governs general sanitation requirements for certified farmers' markets, as defined in this chapter.

27831. Certified farmers' markets shall meet the provisions of Article 6 (commencing with Section 27590) and, in addition, shall meet all of the following requirements:

(a) All food shall be stored at least 15 centimeters (6 inches) off the floor or ground or under any other conditions which are approved.

(b) Food preparation is prohibited.

(c) Approved toilet and handwashing facilities shall

be available within 60 meters (200 feet) of the premises of the certified farmers' market or as approved by the enforcement officer.

(d) No live animals, birds, or fowl shall be kept or allowed within 6 meters (20 feet) of any area where food is stored or held for sale. This subdivision does not apply to guide dogs, signal dogs, or service dogs when used in the manner specified in Section 54.1 of the Civil Code.

(e) All garbage and rubbish shall be stored, and disposed of, in a manner approved by the enforcement officer.

**Article 16. Satellite Food Distribution Facilities**

27840. This article governs general sanitation requirements for satellite food distribution facilities as defined in this chapter.

27841. All satellite food distribution facilities shall be subject to the applicable provisions of Article 6 (commencing with Section 27590) and Article 7 (commencing with Section 27600) and, in addition, shall meet all of the following requirements:

(a) All utensils and equipment shall be scrapped, cleaned, or sanitized as circumstances require.

(b) Utensils and equipment shall be handled and stored so as to be protected from contamination. Single-service utensils shall be contained only in sanitary containers or approved sanitary dispensers, stored in a clean, dry place until used, handled in a sanitary manner, and used once only.

**Article 17. Restricted Food Service Transient Occupancy Establishments**

27850. This article governs general sanitation requirements for restricted food service transient occupancy establishments, as defined in Section 27535.5.

27851. Except as otherwise set forth in this article, restricted food service transient occupancy establishments shall meet the applicable requirements in Article 6 (commencing with Section 27590), Article 7 (commencing with Section 27600), and Article 8 (commencing with Section 27620).

27852. For purposes of Section 27604, a restricted food service transient occupancy establishment shall not be deemed to be a "private home" solely because the owner or operator thereof resides on the premises or prepares on the premises food for his or her consumption and that of his or her family.

27853. Notwithstanding the provisions of Section 27605, restricted food service transient occupancy establishments shall not be required to post signs in toilet rooms in guestrooms.

27854. Restricted food service transient occupancy establishments shall be exempt from the provisions of Section 27610, provided, however, that no live animal, bird, or fowl shall be kept or allowed in any portion of the premises where food for the registered guests of the establishment is used, stored, served, offered for sale, or given away. Aquariums and aviaries shall be allowed if enclosed so as not to create a public health problem.

27855. Restricted food service transient occupancy establishments shall be exempt from the provisions of Section 27614, provided, however, that the enforcement officer shall have the right to disapprove any new or replacement equipment which would create a public health problem.

27856. Restricted food service transient occupancy establishments shall be exempt from the provisions of Section 27628, provided, however, that no person shall store clothing or personal effects in any area used for the storage or preparation of food.

27857. (a) All utensils and equipment shall be scrapped, cleaned, or sanitized as circumstances require.

(b) Restricted food service transient occupancy establishments shall comply with the provisions of subdivision (b) to (c), inclusive, of Section 27623 or, at the option of the owner or operator of the establishment, shall utilize a domestic or commercial dishwasher for the purpose of cleaning and sanitizing multiservice kitchen utensils and multiservice consumer utensils; provided, however, that such dishwasher is capable of providing heat to the surface of the utensils of a temperature of at least 165 degrees Fahrenheit [74 degrees Celsius]. Except as otherwise set forth in this subdivision, restricted food service transient occupancy establishments shall comply with the provisions of Section 27623.

27858. Notwithstanding the provisions of Section 27625, food preparation sinks in restricted food transient occupancy establishments need not have indirect sewer connections.

27859. Restricted food service transient occupancy establishments shall be exempt from the provisions of Section 27629, provided, however, that ventilation shall be provided to remove gases, odors, steam, heat, grease, vapors and smoke from the food establishment. In the event that the enforcement officer determines that such ventilation must be mechanical in nature, such ventilation shall be accomplished by methods approved by the State Department of Health Services.

27860. In restricted food service transient occupancy establishments, only new and replacement walls and ceilings (or their coverings) need comply with Section 27632, provided, however, that all walls and ceilings (and their coverings) must be maintained in a clean and sanitary condition.

27861. Restricted food service transient occupancy establishments shall be exempt from the provisions of Section 27634(b), provided, however, that hot water must be available for janitorial purposes and that waste water from janitorial activities cannot be disposed of in any sink used for washing utensils or for the preparation of food.

27862. Restricted food service transient occupancy establishments shall be exempt from Section 27636. However, no sleeping accommodations shall be allowed in any area where food is stored, prepared, or served.

27863. All food intended for consumption by guests shall be from an approved source. The use of home canned foods and meat and dairy products from unapproved sources is prohibited.

# APPENDIX

# Large Equipment Approved for State Funding

The following pieces of large equipment are commonly used in food service facilities in elementary, junior high, and high schools. The School Facilities Planning Division, California Department of Education, has approved these pieces of equipment for purchase with state funding. Actual equipment needs will vary. Prices listed are as of 1988.

## Approved Furniture and Equipment for Elementary School Cafeterias/Kitchens

| *Quantity* | *Description* | *Unit price* | *Total price* |
|---|---|---|---|
| 1 | Boiler, double, 12-quart (11.3-litre) with cover | $ 72.70 | $ 72.70 |
| 2 | Boiler, double, 20-quart (18.9-litre) with cover | 59.15 | 118.30 |
| 1 | Bowl, baker's, beating, 30-quart (28.3-litre) | 42.50 | 42.50 |
| 1 | Bus wagon, 3 shelves | 325.00 | 325.00 |
| 1 | Cabinet, filing, vertical steel | 142.00 | 142.00 |
| 1 | Cabinet, hot food, portable | 2,675.00 | 2,675.00 |
| 1 | Cabinet, proofing, 20-pan capacity | 1,000.00 | 1,000.00 |
| 1 | Calculator | 150.00 | 150.00 |
| 1 | Can opener, manual operation, #10 can | 528.00 | 528.00 |
| 1 | Carrier, hot food | 125.00 | 125.00 |
| 4 | Cart, utility | 250.00 | 1,000.00 |
| 3 | Chair, 18 inches (45.7 centimetres) | 14.00 | 42.00 |
| 1 | Cooler, milk | 950.00 | 950.00 |
| 1 | Cutter-chopper, food | 2,581.00 | 2,581.00 |
| 1 | Desk | 265.00 | 265.00 |
| 1 | Dicer, power, electric | 2,500.00 | 2,500.00 |
| 1 | Dolly, heavy-duty aluminum | 97.00 | 97.00 |
| 1 | Freezer, reach-in, 47.5-cubic-foot (1.3-cubic-metre) capacity | 2,820.00 | 2,820.00 |
| 1 | Kettle, steam, 40-gallon (151-litre) floor mount | 8,000.00 | 8,000.00 |
| 1 | Mixer attachment, slicer-shredder | 507.00 | 507.00 |

| *Quantity* | *Description* | *Unit price* | *Total price* |
|---|---|---|---|
| 1 | Mixer, bench-type with bowls and beaters | $2,677.00 | $2,677.00 |
| 1 | Oven, double deck, convection | 4,091.00 | 4,091.00 |
| 1 | Oven, microwave | 240.00 | 240.00 |
| 1 | Oven, single deck, convection | 2,041.00 | 2,041.00 |
| 1 | Pan, dish, round, 24-quart (22.7-litre) stainless steel | 28.00 | 28.00 |
| 1 | Pan, 4 inches (10.2 centimetres) deep, 10-quart (9.4-litre) covered | 20.00 | 20.00 |
| 1 | Pan, ice, portable | 138.00 | 138.00 |
| 1 | Pot, large, with cover | 145.00 | 145.00 |
| 1 | Pot, sauce, with cover | 42.00 | 42.00 |
| 2 | Pot, stock, with cover | 54.20 | 108.40 |
| 1 | Rack, bun, 10 buns, 23 x 30 x 35 inches (58 x 76 x 89 centimetres) | 153.00 | 153.00 |
| 2 | Rack, bun, 22 buns, 23 x 30 x 64.5 inches (58 x 76 x 164 centimetres) | 262.00 | 524.00 |
| 6 | Rack, dunnage | 69.00 | 414.00 |
| 2 | Range, 36-inch (91-centimetre) with oven, hood, 6 burners | 2,235.00 | 4,470.00 |
| 1 | Refrigerator, reach-in, 23-cubic-foot (0.7-cubic-metre) capacity | 1,485.00 | 1,485.00 |
| 1 | Scale, baker's | 159.85 | 159.85 |
| 1 | Scoop, baker's, 16-pound (7.3-kilogram) capacity | 60.85 | 60.85 |
| 1 | Skillet, braising pan, tilting, 35-gallon (132-litre) | 4,814.00 | 4,814.00 |
| 1 | Sneeze guard, portable | 117.00 | 117.00 |
| 1 | Stand for mixing bowl | 278.00 | 278.00 |
| 1 | Stool, rigid aluminum,16-inch (40.6-centimetre) top plate | 45.75 | 45.75 |
| 1 | Stool, steel frame | 25.00 | 25.00 |
| 2 | Storage bins, food | 126.00 | 252.00 |
| 1 | Table, baker's | 1,500.00 | 1,500.00 |
| 1 | Table, cook, 30 x 60 x 34 inches, (76 x 152 x 86 centimetres) | | |
| | bottom shelf | 1,690.00 | 1,690.00 |
| 1 | Table, mixer | 732.00 | 732.00 |
| 1 | Table, slicer, on casters | 815.00 | 815.00 |
| 1 | Table, staff dressing room | 32.00 | 32.00 |
| 1 | Table, steam | 4,500.00 | 4,500.00 |
| 1 | Warmer, food, one section | 342.00 | 342.00 |
| | **Total** | | **$55,880.35** |

## Approved Furniture and Equipment for Junior High School Cafeterias/Kitchens

| Quantity | Description | Unit price | Total price |
|---|---|---|---|
| 3 | Bin, under-counter, portable | $ 130.00 | $ 390.00 |
| 1 | Cabinet, proofing, 20-pan capacity | 3,500.00 | 3,500.00 |
| • 1 | Calculator, electronic | 150.00 | 150.00 |
| 1 | Can opener, electric | 172.00 | 172.00 |
| 2 | Cart, utility, four-deck | 310.00 | 620.00 |
| 2 | Cart, utility, two-deck | 250.00 | 500.00 |
| 1 | Cash register, electronic | 1,000.00 | 1,000.00 |
| 1 | Chair, deck-type | 65.00 | 65.00 |
| 2 | Cooler, milk | 950.00 | 1,900.00 |
| 1 | Counter, serving, with tray section, built-in or portable silverware storage section to accommodate removable cylinders, one per serving counter | 1,100.00 | 1,100.00 |
| 1 | Desk, single-pedestal | 265.00 | 265.00 |
| 1 | Dryer, clothes | 315.00 | 315.00 |
| 1 | File cabinet, 4-drawer with lock | 175.00 | 175.00 |
| 1 | Food cutter-chopper | 100.00 | 100.00 |
| 1 | Kettle, steam-jacketed, tilting, 40-gallon (151-litre) | 9,000.00 | 9,000.00 |
| 1 | Kettle, steam-jacketed, tilting, 60-gallon (227-litre) | 13,000.00 | 13,000.00 |
| 1 | Mixer, food, floor model, 60-quart (56.8-litre) capacity, with attachments | 5,850.00 | 5,850.00 |
| 1 | Oven, double, convection | 5,000.00 | 5,000.00 |
| 1 | Oven, triple-deck, bake | 2,000.00 | 2,000.00 |
| 1 | Rack, cooling | 260 00 | 260.00 |
| 1 | Rack, table, portable | 270.00 | 270.00 |
| 1 | Rack, tray and silverware, portable | 650.00 | 650.00 |
| 2 | Range, with oven, electric, commercial heavy-duty | 2,200.00 | 4,400.00 |
| 1 | Refrigerator, reach-in | 2,400.00 | 2,400.00 |
| 1 | Scale, baker's | 160.00 | 160.00 |
| 1 | Slicer, meat | 1,200.00 | 1,200.00 |
| 1 | Steamer, self-contained, 3-compartment | 4,500.00 | 4,500.00 |
| 1 | Table, baker's, with portable bins | 1,500.00 | 1,500.00 |
| 1 | Table, cook's, with shelves | 1,700.00 | 1,700.00 |
| 2 | Table, preparation, with 2 drawers | 700.00 | 1,400.00 |
| 1 | Truck, hand, heavy-duty | 150.00 | 150.00 |
| 1 | Washer, clothes | 385.00 | 385.00 |
| | **Total** | | **$64,077.00** |
| 1 | Freezer, ice cream | 1,300.00 | 1,300.00 |
| 1 | Milk shake machine | 6,000.00 | 6,000.00 |
| | **Total** | | **$7,300.00** |

## Approved Furniture and Equipment for High School Cafeterias/Kitchens

| *Quantity* | *Description* | *Unit price* | *Total price* |
|---|---|---|---|
| 1 | Adding machine | $ 250.00 | $ 250.00 |
| 4 | Bin, portable, aluminum | 126.00 | 504.00 |
| 1 | Bowl, 5-quart (4.7-litre) food mixer | 25.00 | 25.00 |
| 1 | Cabinet, file, 4-drawer, letter-size | 175.00 | 175.00 |
| 1 | Can opener | 528.00 | 528.00 |
| 4 | Cart, mobile, three shelves | 175.00 | 700.00 |
| 4 | Cart, stainless steel | 250.00 | 1,000.00 |
| 4 | Cash register, 7 classifications | 1,100.00 | 4,400.00 |
| 3 | Cooler, milk | 1,200.00 | 3,600.00 |
| 1 | C-wing whip | 45.00 | 45.00 |
| 4 | Double boiler and stock pot | 119.00 | 476.00 |
| 1 | Dryer, clothes, front-loading | 314.00 | 314.00 |
| 1 | Food cutter | 2,581.00 | 2,581.00 |
| 1 | Freezer, reach-in, 80-cubic-foot (2.3-cubic-metre) stainless steel exterior, aluminum interior | 4,500.00 | 4,500.00 |
| 1 | Hand truck | 150.00 | 150.00 |
| 1 | Ice cream cabinet | 1,000.00 | 1,000.00 |
| 2 | Juice dispenser | 550.00 | 1,100.00 |
| 1 | Milk shake machine | 6,000.00 | 6,000.00 |
| 1 | Mixer, food, 5-quart (4.7-litre) | 1,500.00 | 1,500.00 |
| 1 | Mixer, food, 60-quart (56.8-litre) | 6,800.00 | 6,800.00 |
| 1 | Mixer splash cover | 50.00 | 50.00 |
| 1 | Mixer stand | 278.00 | 278.00 |
| 1 | Mixer, 20-quart (18.9-litre) | 1,200.00 | 1,200.00 |
| 3 | Oven, double, natural gas | 4,000.00 | 12,000.00 |
| 8 | Plate dispenser, stainless steel | 305.00 | 2,440.00 |
| 1 | Portable table rack for slicer | 269.00 | 269.00 |
| 1 | Proof box | 1,000.00 | 1,000.00 |
| 10 | Rack, dry storeroom, aluminized steel | 475.00 | 4,750.00 |
| 8 | Rack, for walk-in refrigerator, stainless steel | 343.00 | 2,744.00 |
| 2 | Rack, mobile, kitchen storage, aluminized steel | 475.00 | 950.00 |
| 1 | Rack, mobile, pot and pan storage, stainless steel | 475.00 | 475.00 |
| 1 | Range, natural gas, with 31 x 31-inch-deep (78.7 x 78.7-centimetre-deep) hot-top sections | 2,200.00 | 2,200.00 |
| 1 | Refrigerator, 9-cubic-foot (0.3-cubic-metre) | 400.00 | 400.00 |
| 3 | Refrigerator, reach-in, 25-cubic-foot (0.8-cubic-metre) stainless steel exterior finish | 3,500.00 | 10,500.00 |

| *Quantity* | *Description* | *Unit price* | *Total price* |
|---|---|---|---|
| 2 | Roll warmer | $ 900.00 | $1,800.00 |
| 1 | Scale | 159.00 | 159.00 |
| 1 | Slicer, automatic | 1,535.00 | 1,535.00 |
| 1 | Steamer cabinet, compartments with enamel exterior and stainless steel interior | 2,500.00 | 2,500.00 |
| 3 | Steam table, 72 inches (182.8 centimetres) long, stainless steel cutting board | 1,500.00 | 4,500.00 |
| 4 | Stool, 24 inches (61 centimetres) high | 35.00 | 140.00 |
| 1 | Table, cook's, 30 x 96 x 32 inches (76.2 x 243.8 x 81.3 centimetres), stainless steel | 1,753.00 | 1,753.00 |
| 1 | Table, cook's, 30 x 72 inches (76.2 x 182.8 centimetres), stainless steel | 1,711.00 | 1,711.00 |
| 1 | Table, staff dressing room | 10.00 | 10.00 |
| 1 | Table, utility, preparation | 605.00 | 605.00 |
| 5 | Tray dispenser, stainless steel | 305.00 | 1,525.00 |
| 1 | Vegetable slicer, attachment, 9-inch (22.9-centimetre) | 1,200.00 | 1,200.00 |
| 1 | Washer, clothes, front-loading | 385.00 | 385.00 |
| | **Total** | | **$92,727.00** |

# APPENDIX

# Planning Aids

## MECHANICAL SYMBOLS AND ABBREVIATIONS

| | |
|---|---|
| | Exhaust duct connection at ventilator or dishwasher |
| | Supply duct (makeup air) connection at ventilator |
| | Ceiling-mounted makeup air diffuser |
| **cfm** | Cubic feet of air per minute |
| **fpm** | Feet per minute |
| **SP** | Static pressure |

## PLUMBING SYMBOLS AND ABBREVIATIONS

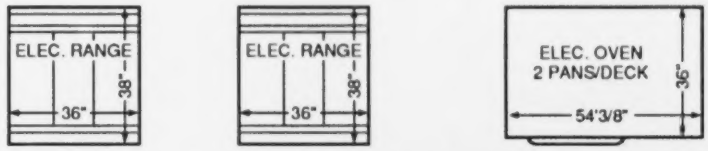
| | |
|---|---|
| ● | Hot and/or cold water and gas connection |
| ○ | Drain: directly connected |
| ○- - - | Drain: indirectly connected to floor sink |
| | Floor sink |
| | Area floor drain (suggested locations shown). Floor should not slope to drain. Provide a recess 6"(15.2 cm) around drain. |
| | Vertical dimension rough-in symbol (Number in center of symbol indicates dimension in inches from finished floor to center of rough-in point.) |
| **FSEC** | Food service equipment contractor |
| **PC** | Plumbing contractor |
| **HW** | Hot water |
| **CW** | Cold water |
| **H&CW** | Hot and cold water |

## ELECTRICAL SYMBOLS AND ABBREVIATIONS

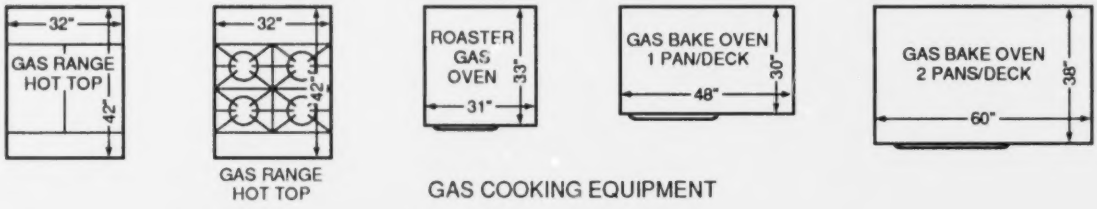
| | |
|---|---|
| ● | Point of final connection on the equipment |
| | Junction and/or handy box |
| | Duplex convenience outlet |
| | Special purpose outlet |
| | Vertical dimension rough-in symbol (Number in center of symbol indicates dimension in inches from finished floor to center of rough-in point.) |
| **FSEC** | Food service equipment contractor |
| **EC** | Electrical contractor |
| **J-Box** | Junction and/or handy box |
| **DCO** | Duplex convenience outlet |
| **SPO** | Special purpose outlet |

# SCALE TEMPLATES OF KITCHEN EQUIPMENT

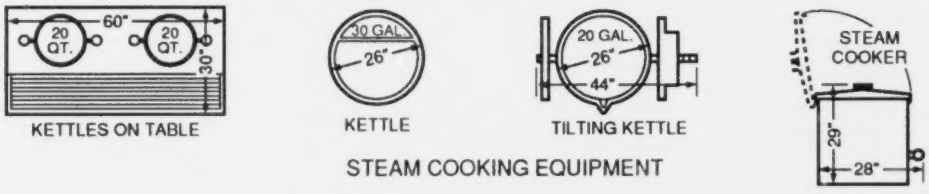
(Dimensions and capacities given in U.S. customary system.*)



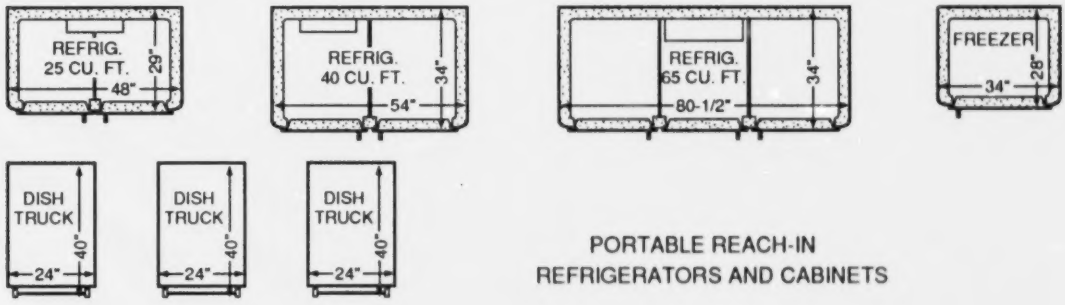

ELECTRIC COOKING EQUIPMENT



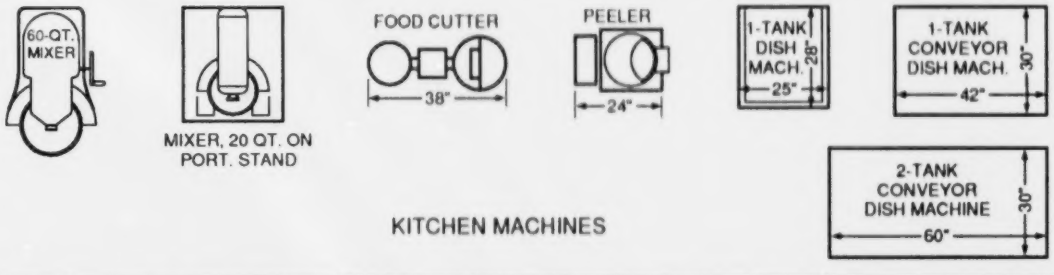

GAS COOKING EQUIPMENT




STEAM COOKING EQUIPMENT




PORTABLE REACH-IN
REFRIGERATORS AND CABINETS

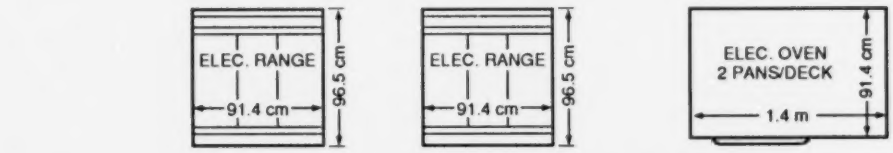



KITCHEN MACHINES

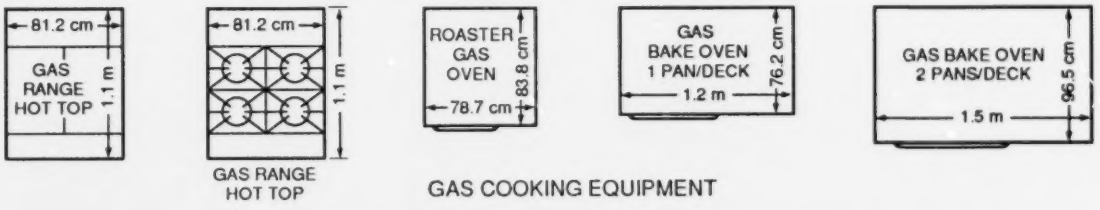
*See next page for equivalent metric dimensions and capacities.

# SCALE TEMPLATES OF KITCHEN EQUIPMENT *(Continued)*

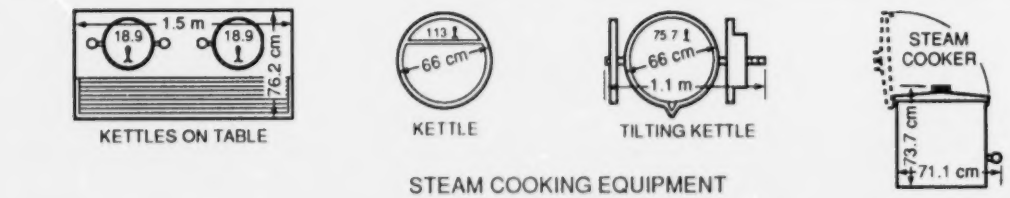
(Metric dimensions and capacities)



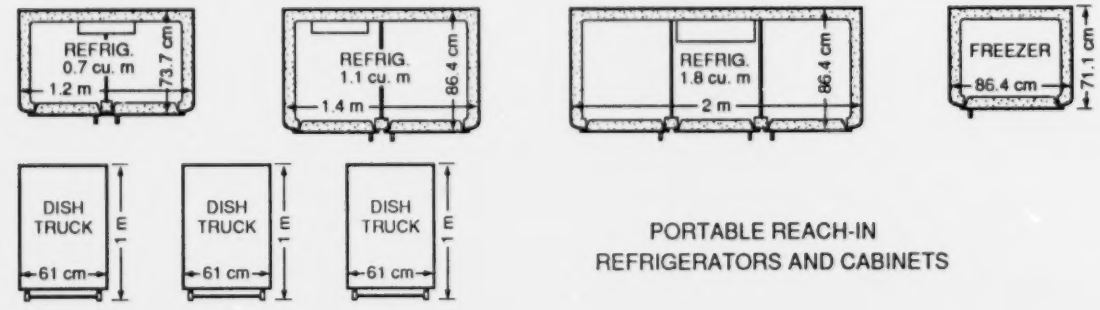

ELECTRIC COOKING EQUIPMENT



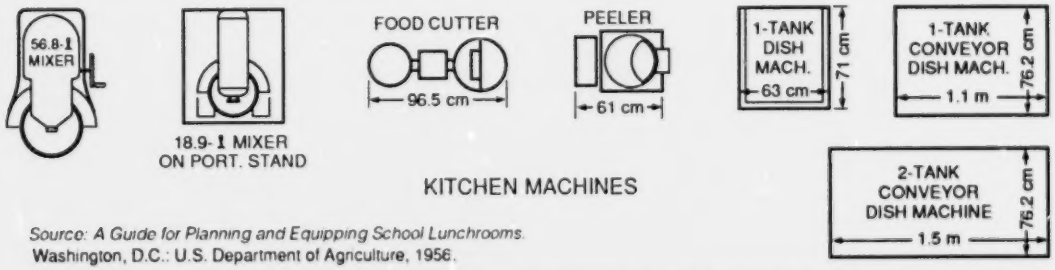

GAS COOKING EQUIPMENT




STEAM COOKING EQUIPMENT

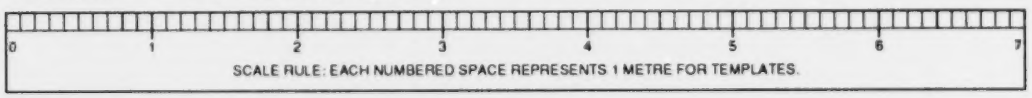



PORTABLE REACH-IN
REFRIGERATORS AND CABINETS



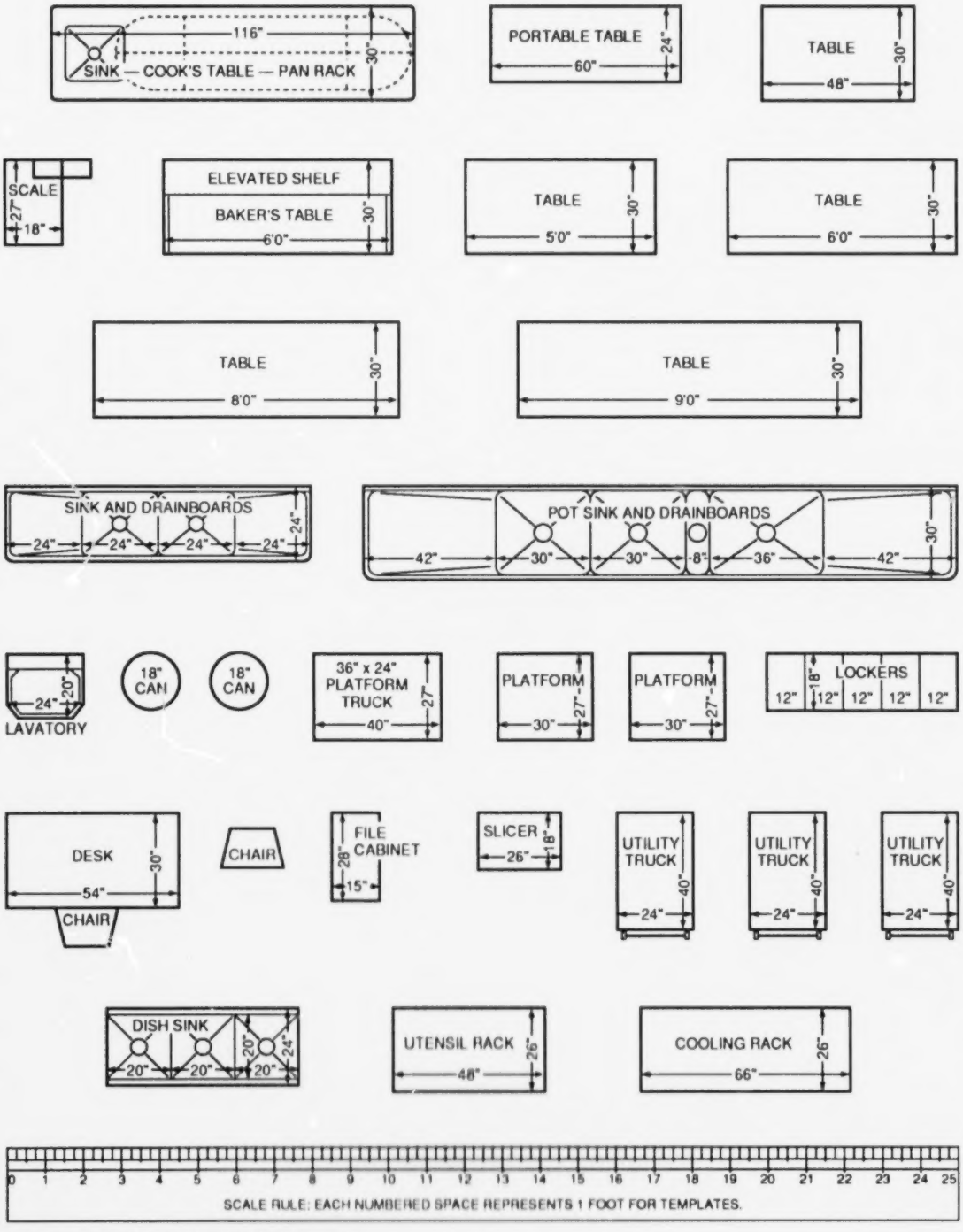

KITCHEN MACHINES

*Source: A Guide for Planning and Equipping School Lunchrooms.*
Washington, D.C.: U.S. Department of Agriculture, 1956.



## SCALE TEMPLATES OF KITCHEN EQUIPMENT *(Continued)*

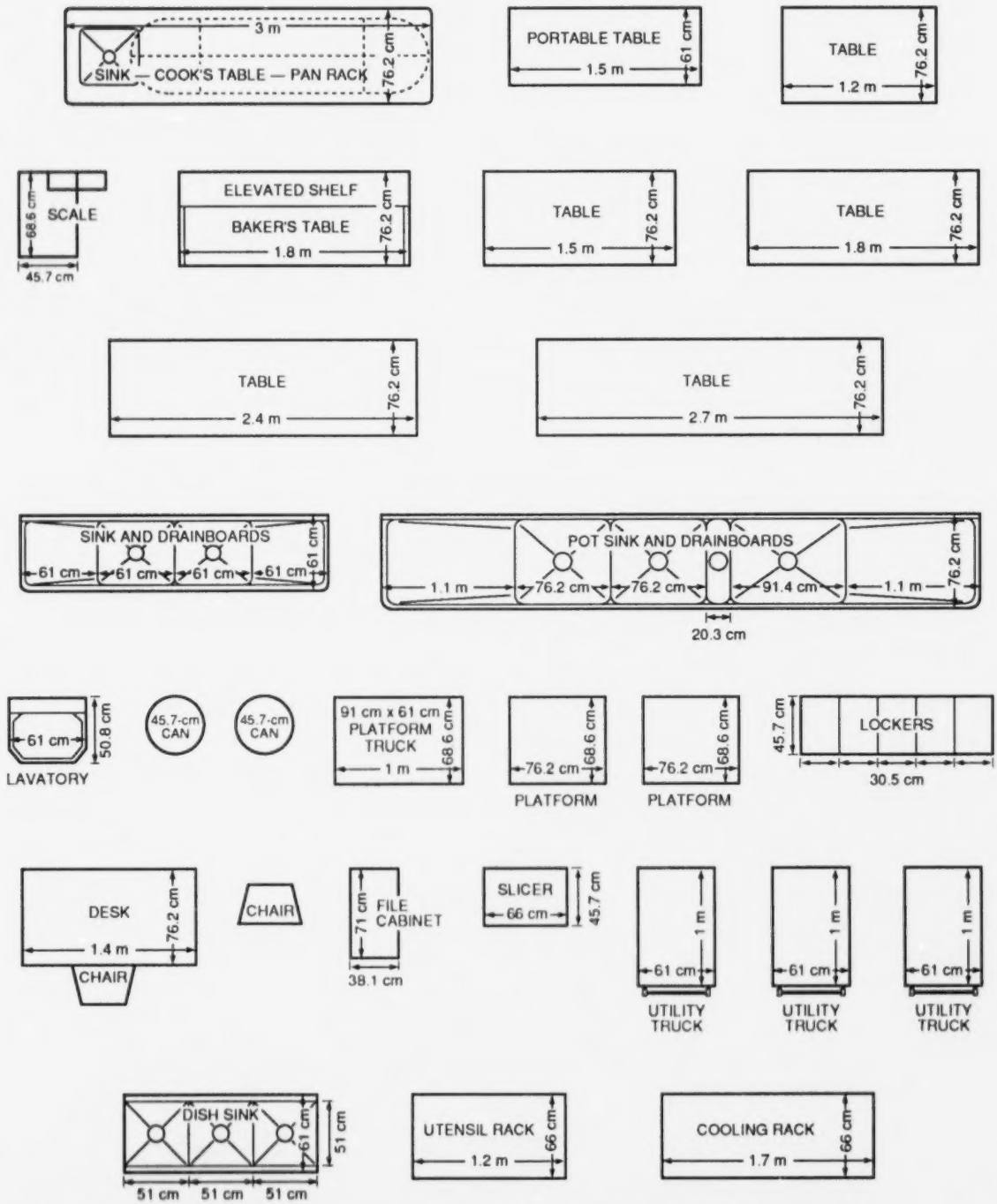
(Dimensions given in U.S. customary system.*)



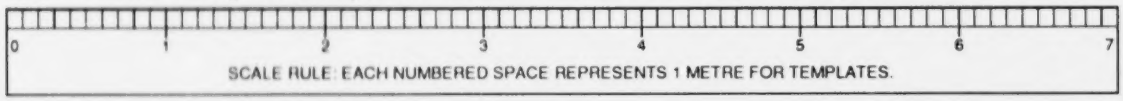

*See next page for equivalent metric dimensions.

# SCALE TEMPLATES OF KITCHEN EQUIPMENT *(Concluded)*

(Metric dimensions)

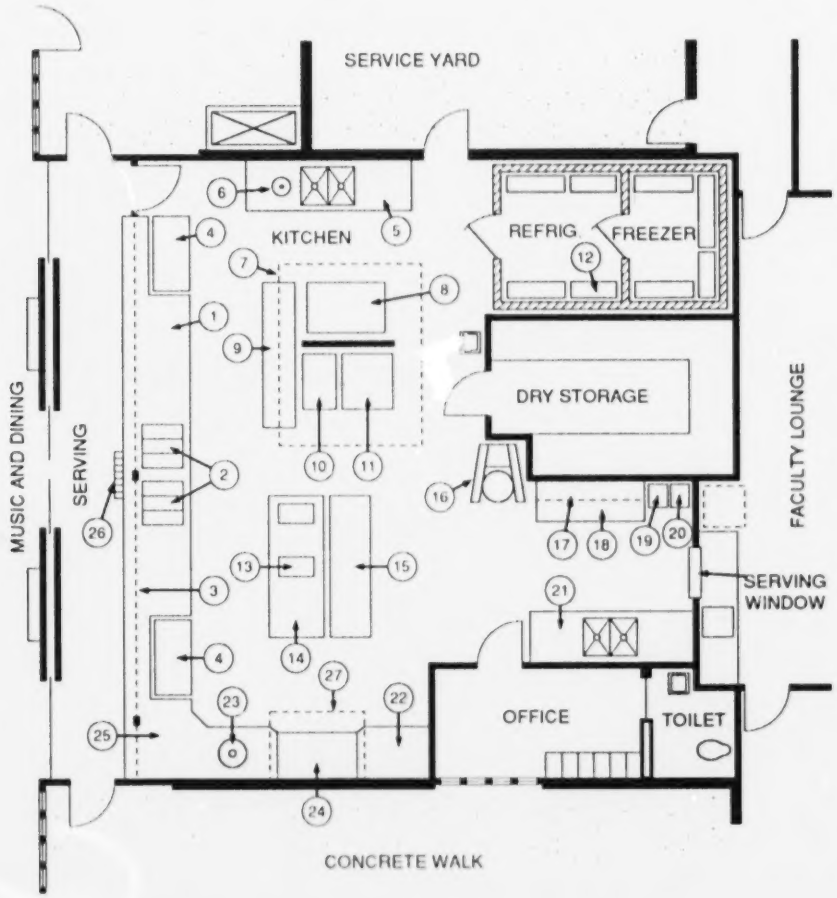



*Source: A Guide for Planning and Equipping School Lunchrooms.* Washington, D.C.: U.S. Department of Agriculture, 1956.



# APPENDIX

# Sample Plan and Equipment Layout for a Production Kitchen

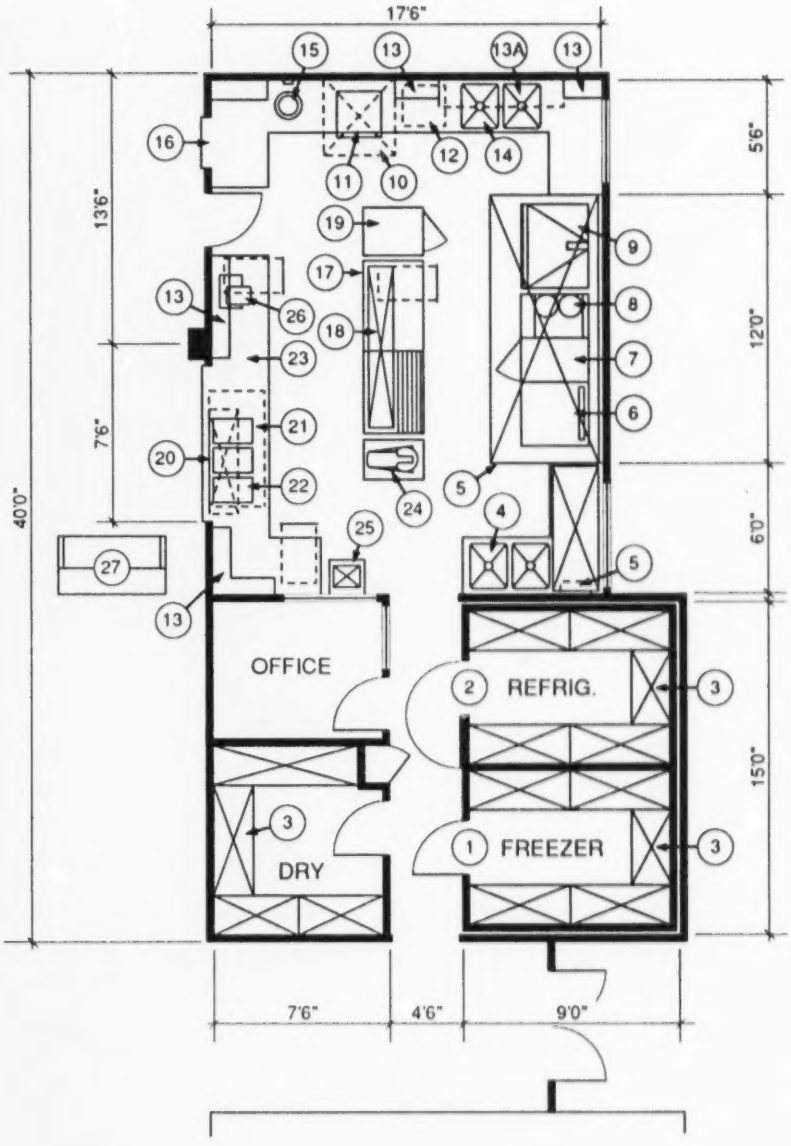



## Sample Plan for a Production Kitchen

1. Stainless steel serving counter
2. Hot food units
3. Sneeze guards
4. Milk dispenser
5. Vegetable counter and sinks
6. Garbage disposal
7. Kitchen hood
8. Power tilt braising pan
9. Work table
10. Range
11. Convection oven
12. Prefabricated refrigerator/freezer
13. Food slicer
14. Preparation table and sink
15. Preparation table
16. 60-quart (56.8-litre) mixer
17. Shelf
18. Baker's table
19. Proofing cabinet
20. Racks
21. Pot wash counter and sinks
22. Clean dish counter
23. Prerinse machine and disposal
24. Dish-washing machine
25. Dirty dish counter
26. Silverware dispenser
27. Dishwasher hood

*Note:* This floor plan is provided for reference purposes only. It is *not* considered a "model" or "ideal" plan, and the California Department of Education does not endorse its use.

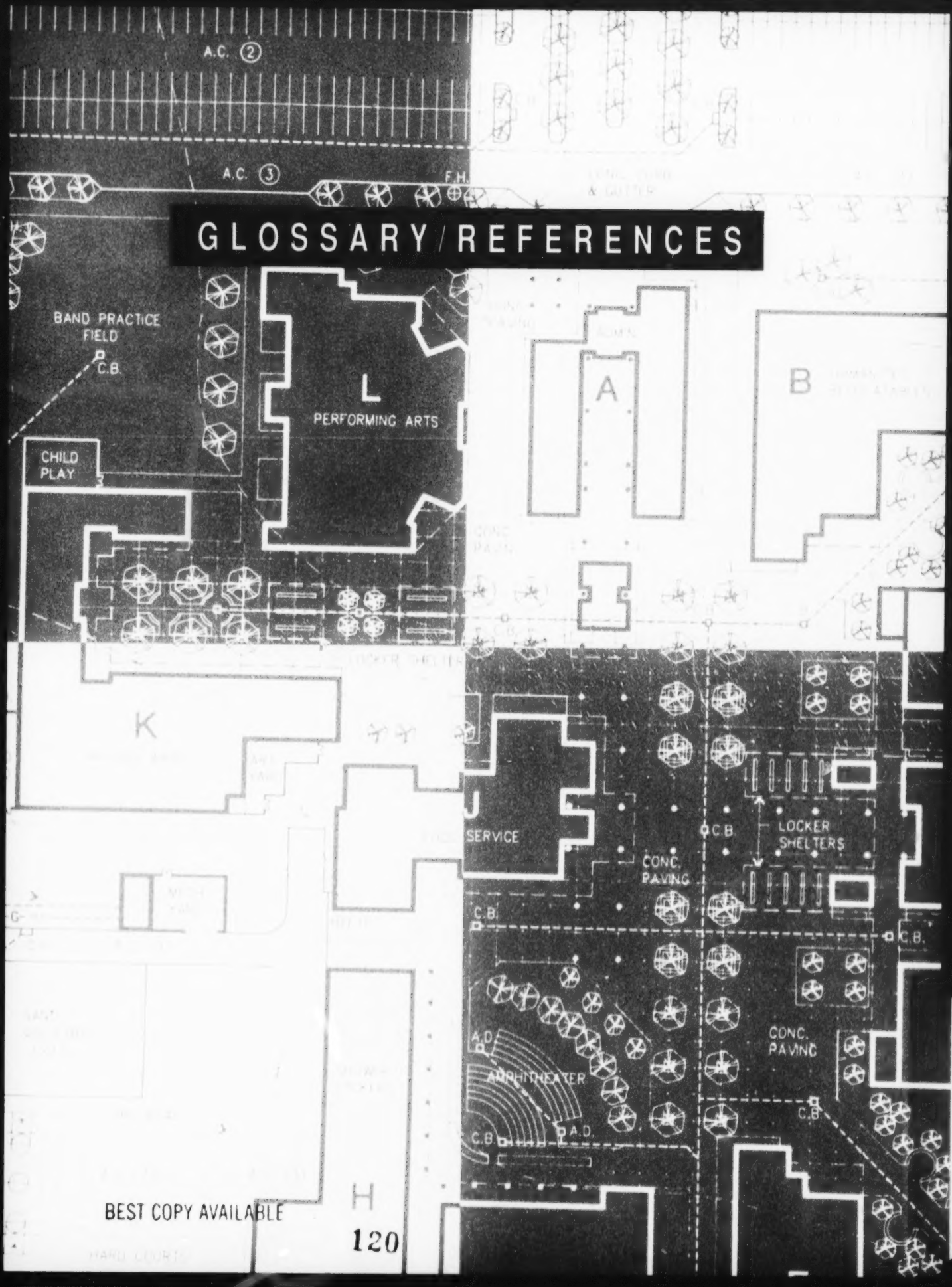
*Source:* Adapted from drawings provided by the Merced City Elementary School District and Carmichael-Kemp Architects.




## Sample Layout of Equipment in a Production Kitchen

1. Freezer, walk-in
2. Refrigerator, walk-in
3. Shelving unit
4. Preparation sinks
5. Extractor and fire system
6. Convection ovens
7. Convection steamer
8. Range with oven and burners
9. Tilt braising pan
10. Vapor hood
11. Dishwasher
12. Hot water booster
13. Overhead shelf
13A. Upper storage cabinets
14. Pot wash sinks
15. Disposer with panel and hose
16. Tray-return table
17. Cook's table
18. Shelves and utensil rack
19. Proof/hot cabinet
20. Sneeze-guard assembly
21. Hot food warmer cabinet
22. Hot food warmers
23. Work counter
24. Mixer and cart
25. Hand-washing sink
26. Slicer unit
27. Milk cabinet

*Note:* This floor plan is provided for reference purposes only. It is *not* considered a "model" or "ideal" plan, and the California Department of Education does not endorse its use.




# GLOSSARY/REFERENCES

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# GLOSSARY

**AC**—Alternating current; air-conditioning.
**AGA**—American Gas Association (seal of approval required for gas equipment).
**AIA**—American Institute of Architects.
**A la carte**—Food items sold individually and separate from the meal at a separate price for each item.
**amp**—Ampere, the standard measure of the strength of an electric current.
**ASME**—American Society of Mechanical Engineers (seal of approval required on steam equipment).
**Back shelf ventilator**—A system for catching and removing heated air and steam close to the point of origin (can be used instead of a canopy or hood when no top-surface cooking is being done).
**Base kitchen**—A kitchen that prepares food for other schools to serve.
**BHP**—Boiler horsepower. Used for rating steam equipment.
**Btu**—British thermal unit. The amount of heat required to raise the temperature of one pound (0.5 kilogram) of water 1 degree Fahrenheit (0.6 degree Celsius).
**CAD**—Computer-aided design. Developed in the early 1980s, this system is based on an interactive graphic concept. Several companies have developed software that is used for this purpose.
**Cafeteria funds**—Money received from the sale of food or for services performed by the cafeteria staff.
**Centimetre** (cm)—A metric length equal to 0.39 inch.
**cfm**—Cubic feet per minute. Units used to measure the volume of air flowing through a ventilation system.
**Color code**—Use of colors to identify specific areas.
**Condensing unit, refrigeration**—A mechanical compressor used as an air- or water-cooling device.
**Convection oven**—An oven, gas or electric, in which the heat is circulated through the chamber by a fan or blower system.
**Convenience foods**—Food items that have been processed before delivery and that may or may not require additional preparation before serving.
**Cook/chill** (cook/freeze)—Ready-made foods that are fully cooked, packaged, and chilled or frozen and that are reheated at time of service.
**Cove base**—An impervious material applied to floor and wall junctions in food service areas, toilets, and walk-in refrigerators that makes it easier to clean the floor.
**Cove corners**—Smooth and rounded corners that do not come to a point.
**Cubic footage**—Gross interior space. The term is often used in describing refrigerated and freezer storage space.
**CURFFL**—California Uniform Retail Food Facilities Law. Enacted in June, 1984, this statute sets forth the mandated health, sanitation, and food safety and storage standards required for food service operations.
**CW**—Cold water.
**dB**—Decibels, a measure of sound levels. A level below 50 dB is a quiet level, and a level above 90 dB is a danger level.
**DC**—Direct current.
**Design**—A scheme for developing the overall function and the entire concept of a food service facility.
**Dish-washing area**—The space provided for washing, sterilizing, and drying the dishes, equipment, and utensils used in preparing and serving food.
**Disposable service**—The utensils, trays, plates, and cups that can be disposed of after one use. These utensils are also referred to as single-service items.
**Donated foods**—Foods purchased and distributed by the U.S. Department of Agriculture.
**Dry storage area**—The space provided for the orderly storage of consumable items that do not require refrigeration and for storage of paper and disposable items used in food service.
**Dunnage rack**—A mobile or stationary platform used for storing bulky items, stacked cases, or sacks.
**Efficiency**—The ratio of actual performance time to standard performance time under good conditions.
**Employees' area**—Lockers, lounges, and rest rooms.
**FC**—Footcandle. A measure of the luminance (brightness) of a surface.
**FD**—Floor drain.
**Finishing kitchen**—A kitchen that receives prepared foods for reconstituting or heating, assembling, portioning, and serving.
**Flow diagram**—A graphic representation of the movement of food products through the preparation and serving processes.
**Food production center**—A facility in which food is prepared to be served at another location.
**Food service system**—The overall performance plan for a school's or school district's food service program.
**Freezer**—Storage space at a temperature of zero degrees Fahrenheit (–17.8 degrees Celsius) or below.
**Fryer**—A floor- or bench-mounted unit for cooking in deep fat or oil.
**General contract**—The construction contract. All equipment that is to be attached to the building is usually included in the general contract.
**Grease filter or extractor**—A rectangular or round frame with several layers of wire mesh that is mounted in the exhaust system for removing grease.
**Griddle**—A stove-top cooking unit with extra-thick steel plating.

**HP**—Horsepower.
**HW**—Hot water.
**Kettle, steam-jacketed**—A large cooking kettle that in use has steam between its inner and outer walls.
**Kiosk**—A decentralized dispensing or serving area that is sometimes mobile.
**kw**—Kilowatt.
**Layout**—The arrangement of physical facilities and equipment within an area.
**Loading area**—The space outside the kitchen that is used for the pickup and delivery of food and nonfood items.
**Maintenance area**—The space provided for holding and disposing of refuse and for washing equipment that is used for this purpose.
**Makeup air**—The supply of air that is drawn into an area when the ventilation system is on.
**Metre** (m)—A unit of length equal to 39.37 inches.
**Modular**—A uniform-size piece of equipment—usually built around the pan sizes 12 by 18 inches (30.5 by 45.7 centimetres) and 28 by 26 inches (71.1 by 66 centimetres), which allows for use in varying configurations and fitting within different equipment.
**NEMA**—National Electrical Manufacturers Association.
**NFPA**—National Fire Protection Association. This organization publishes *NFPA Bulletin 96*, which may be obtained from the local fire-protection association.
**NSF**—National Sanitation Foundation. This organization's seal of approval certifies compliance with specified sanitary design requirements.
**Office area**—The space used by the food service manager for general management duties such as recordkeeping, menu planning, ordering, filing, money-handling, administration, and private discussions with employees.
**OLA**—Office of Local Assistance, State Department of General Services.
**On-site kitchen**—A kitchen that prepares and serves food at the same location (may be referred to as a self-contained kitchen).
**OSHA**—The Occupational Safety and Health Act, the statute that sets forth the safety standards an employer must follow.
**Permit**—A written authorization for a facility to operate issued by a local sanitarian who is appointed by the California Director of Health Services.
**Preparation kitchen or area**—The space provided for the total processing of food from a raw to a ready state.
**Productivity**—The rate of output per unit of time.
**Proof box or cabinet**—An enclosed area with a heater and humidifier.
**Prospectus**—An operational model of the food service area.
**psi**—Pounds per square inch, the units used in measuring steam pressure.
**Punch list**—A list of the problems or the incomplete work at a construction site that must be fixed before the building is accepted as complete.
**Range**—A piece of equipment used for top-surface cooking and that has an oven at the bottom.
**Receiving area**—The space inside the building used for checking shipments for accuracy, quality, and quantity.
**Receiving kitchen or school**—The school kitchen that receives prepared foods from another preparation center (also referred to as a serving kitchen).
**Refrigeration**—The areas or units that keep food at a temperature below 45 degrees Fahrenheit (7.2 degrees Celsius), including refrigerators, coolers, and freezers.
**Scale**—The relationship of the size of a floor plan drawing to actual floor dimensions. The ratios most frequently used are 1/8 inch (0.3 centimetre) equals 1 foot (30 centimetres) and 1/4 inch (0.6 centimetre) equals 1 foot (30.5 centimetres).
**Self-contained kitchen**—A kitchen in which food is prepared and served on the premises (referred to in this document as an on-site production kitchen).
**Serving area**—The space where food is served to the customer (includes the area where food items are displayed and replenished).
**Single-service utensil**—A utensil that is manufactured and intended for one use only and that will be discarded after use.
**Soffit**—A sound-absorbent material that can be put above the serving line to reduce noise and improve the appearance of the serving area.
**SP**—Static (air) pressure.
**Steamer**—A cooker with compartments in tiers that cooks with low-pressure steam.
**Steam-jacketed kettle**—A kettle that holds steam between the interlining and the outer shell.
**Swamp air**—Air supplied by an evaporative cooler (nonrefrigerated air).
**Template**—A pattern, usually to a set scale (used in this guide to show the configuration of equipment in a kitchen).
**Time and motion economy principles**—The rules that apply to human motions for the optimum output of work in a given period of time.
**Transport assembly area**—The space used to hold and load carriers to be sent to another school.
**Tray slide** (rail)—The horizontal surface along which a tray of food is moved in a cafeteria line.
**Type A lunch**—This term was changed by the USDA to school lunch meal patterns. It describes a group of foods that meets federal regulations for a nutritionally adaquate lunch. The state of California uses the term *reimbursable lunch patterns*.
**UL**—Underwriters' Laboratories, a testing agency that issues a seal of approval.
**VCP**—Visual comfort probability.
**Vertical cutter-mixer** (VCM)—A machine that cuts and mixes at high speeds.
**Workstation**—The area and equipment used to do similar work.

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